PUBLIC COMMUNICATIONS GUIDELINES DEDICATED TO NUCLEAR AND RADIOLOGICAL EMERGENCIES

1. BACKGROUND

Communicating effectively with the public about nuclear and radiological (herein after referred to as radiation) emergencies is key to successful emergency management as this will support the implementation of protective actions and contribute to minimizing negative psychological impacts.

Effective public communication has been shown to:

- encourage the smooth implementation of appropriate protective actions for people at risk and reassure individuals who are not directly at risk by reducing rumors and fears.
- facilitate relief efforts
- maintain public trust and confidence in the organizations responsible for ensuring the welfare of the public. Trust and availability of information are the key elements for risk communication.
- be effective when using plain language.

In addition to local emergency services (e.g., local medical, law enforcement, and fire brigades), Public Information Officers (PIO) have the most important role in the early response to a radiation emergency. To successfully carry out that role, it is essential for the **PIO to be prepared and trained** before an emergency occurs.

2. PURPOSE

The purpose of this document is to provide practical guidance to those responsible for keeping the public and media informed and for coordinating all sources of official information to ensure a consistent message is being provided to the public before, during and after a radiation emergency.

Main objectives:

- Explains the need for **effective public communications** in radiation emergencies
- Describes **how to prepare and train those responsible** for emergency communications before a radiation emergency occurs.
- Provides **communication principles and tools** to assist PIOs in achieving effective communication during a radiation emergency and to help in mitigating its effects.
- Support the development of **communication materials** for population

The guidance in this publication is applicable to the full range of potential radiation emergencies and it is not limited to what is commonly considered a "radiation emergency", such as the release of radioactive materials from a nuclear power plant, or the loss or theft of a dangerous radioactive source. The scope of this publication includes any radiation event to which the public might respond as if it were an emergency, regardless of how that event is technically categorized.

3. EFFECTIVE PUBLIC COMMUNICATIONS IN RADIATION EMERGENCIES

The public has little knowledge and a great deal of uncertainty in any issue involving radiation. This can be attributed to several factors:

This field of expertise is not readily accessible to the general public. At the same time, however, the effects of, for example, nuclear accidents are well known. The lack of knowledge means that most people are dependent on statements made by experts or the information communicated by the media.

The primary objective of emergency response organizations (authorities) should be to ensure the smooth implementation of the actions taken to protect life, health and the environment. However, this goal makes major demands on the response organization's credibility and trust in the eyes of the public. In order to influence decisions and change behavior, **it is essential that all stakeholders be able to trust the information provided as complete and correct.** In addition, people must know who the responsible authority is before the actual emergency takes place.

Public communications activities must be visible; they must make an impact on the media so that a "recognition effect" is achieved. Thus, for an authority to be effective, it must have a good reputation, be seen as open and working in the public interest, as well as be well known to the public.

4. SPECIFIC ACTIONS IN THE PREPAREDNESS PHASE + - list all actions

4.1. Development of the public communication action guides and procedures :

- General actions for PIO/ team in an emergency – see Annex 1
- Practical arrangements for the PIO
- Developing messages for the public
- Plain language
- Interview preparation

4.2. The selection of the spokesperson

The selection of the spokesperson is based primarily on three factors:

- technical expertise,
- level of authority and
- communication skills.

To be credible, the spokesperson should be an expert in the area and hold a position with a level of authority appropriate to the matter about which he/she will be speaking. In an emergency, the spokesperson is often a senior official involved in managing the response.

The spokesperson must also be a good communicator, who can empathize with the public's concerns and be able to simplify scientific and technical information. He/she should work with the PIO to develop appropriate plain language explanations and analogies to explain technical matters.

In communicating with the media, the spokesperson should be:

- Straight forward.
- Comfortable and confident.
- Honest and open
- Brief.
- Human and sensitive.
- Personal.

- Positive and consistent.
- Attentive and empathic
- Energetic.
- Committed and sincere.
- Credible (demonstrated expertise)
- Stay calm under pressure

Selection process of the Spokesperson (*recommendation from the expert from the CNCAN or the MoI with a minimum training in public communication for such emergencies, It would be the most efficient that Spokesperson is someone from CNCAN, alternatively from MoI*).

- **Designated spokespersons** from all involved institutions should receive an initial training in radiation emergencies within 4 months from the date they are designated in addition to annual refresher training. These training courses should offer a basic background knowledge that include a familiarization with terminology, radiation, nuclear and radiological, facilities, hazard assessment, emergency classes/ types of emergencies, INES levels, legal security nuclear framework, protection strategy and protective measures, risk perception, authorities involved in the response, an overall overview on the main pre-approved key messages for all phases of response.

- All **technical experts** that may be designated as a technical spokesperson are provided with media training on a regular and consistent basis. These media training courses should include the basics of working with journalists, public speaking basic knowledges. Media training should be provided to all technical experts who may be called on to brief the media during an emergency.

- All spokespeople and technical experts should be well prepared for potentially challenging and stressful interactions with the media during a radiation emergency. It is imperative that training is conducted well in advance of any potential emergency. The following elements of media training should be considered to ensure spokespeople and technical experts are properly prepared:
    - Interview preparation.
    - Developing key messages.
    - Training for broadcast interviews.
    - Basics of crisis communications.

4.3. Training program – to test the Coordination mechanism of public communication before activation of national level needs to be further defined (see the CNCAN Plan)
4.4. Exercise program

- ESTABLISHING THE APPROPRIATE INFRASTRUCTURE IN THE PUBLIC INFORMATION AND COMMUNICATION CENTRE

- List of communication equipment (establish the minimum and optimal) communication channels

LIST OF EQUIPMENT

1. Phones-land lines (analog, digital) GSM, TETRA system, mobile, satellite (star link/iridium)
2. Internet connection
3. Translation service
4. Video equipment
5. Power supply backup (UPS)
6. Tv, radios
7. Computers
8. Printers, scanners, shredders
9. Vests (PIO)
10. Clocks
11. Communication platform (ELAN)
12. Media monitoring service
13. Emergency web site
14. Access to the IAEA's USIE platform
15. Access to ECURIE an EURDEP platform
16. Communication channels under bilateral agreements
17. Communication room
    - spacious enough for xx personnel
    - furniture (desks, chairs)
    - communication equipments
18. Conference room (for press conferences, media briefings)
    - spacious enough for xx personnel and journalists
    - furniture (desks, chairs)
    - communication equipments
19. Accounts set for social media

5. RISK PERCEPTION

Risk perception considers the difference between how risk is perceived by the public versus how the risk is assessed and measured by experts.

In fact, the goal of risk communication is not to force a change between the divergent views of the expert and the public, but rather to develop an understanding of these factors so that they may be considered and addressed. This requires an understanding of the underlying factors on which public perception of risk is based.

Trust and availability of information are the key elements for risk communication. To establish this trust, particularly during emergencies where the public may be asked to comply with protective actions, information provided to the public must not only satisfy their needs but must also be provided in **plain language** so that it can be easily understood and facilitate their decision making.

Understanding the specific reasons why people feel the way they do about radiation emergencies is the key to more effective risk communication about such emergencies. Psychology provides robust scientific evidence to explain the specific emotions and motives involved in risk perception and illuminate **why some risks feel more threatening than others,** regardless of the actual situation. The science which explains human risk perception is as robust and important to emergency response as the science of physics and medicine.

The distinct characteristics of a threat from radiation that must be understood and accounted for in emergency response public communications are presented in Table 7 and explained.

Though these risk perception characteristics are listed individually, a combination of several is usually involved in any emergency, depending on the circumstances.

Sometimes, an event is not considered to be an emergency to experts or responders but is perceived very differently by the general public.

TABLE 1 - INFLUENCES TO THE PUBLIC'S PERCEPTION OF RISK

Risk perception characteristics	**Greater perception of risk**	**Lesser perception of risk**
Media attention	A lot of media attention	Little media attention
Understanding	Scientific concepts difficult to understand	Easily understood concepts
Familiarity	Unfamiliar hazards	Familiar hazards
Scientific certainty	Scientific consensus or certainty about situation	Lack of scientific consensus or uncertainty about situation
History / Stigma	Accidents have already occurred	No accidents have previously occurred
Onset of effects	Little warning of onset of effects	Anticipation of onset of effects
Reversibility	Effects are not reversible	Effects are reversible
Trust	Lack of trust in officials and institutions	Trustworthy officials and institutions
Availability of information	Insufficient authoritative information	Sufficient authoritative information

Voluntariness	Compulsory; participation in the situation not dependent on individual will	Voluntary nature of participation in a situation
Control	Absence or limitation of possible personal influence on outcome of situation	Full or partial personal control of situation by individual
Fairness of risk distribution	Distribution of costs and benefits is unfair	Distribution of costs and benefits is fair
The origin of risks	Risks are the result of human activity	Risks are the result of natural events or processes
Catastrophic potential	Considerable number of injured people	Small number of victims
Personification	Risks are represented by a specific victim or potential victim	Risks are represented as an idea
Personal participation	The situation involves individual and his/her family	The situation does not have a direct relation to the individual or his/her family
Awareness	Lack of awareness	Awareness exists
Dread	A risk where the outcome involves greater pain and suffering	A risk where the outcome does not involve greater pain and suffering
Influence on children and future generations	Consequences representing a special danger to children and a threat to future generations	Consequences not representing a special danger to children or a threat to future generations

IMPORTANCE OF TRUST IN PUBLIC COMMUNICATIONS

The more trust people feel toward the staff and agencies managing an emergency, the less afraid they will be. If their trust in these people and agencies is lost, their fear rises. Any action or communication that damages trust, such as delayed, withheld, or misleading information, will raise public apprehension and actively contribute to increased risk to public health and wellbeing. Table 8 presents the positive and negative impacts to trust through message delivery, personal interaction, and institutional activity.

TABLE 2 - FACTORS INFLUENCING TRUST

Positive	**Negative**
Message	
Timely information	Delayed information
Consistent updates with accurate information	Inconsistent updates
Clear and concise	Full of jargon and overloaded

Unbiased	Biased
Takes into account public values, fears and concerns	Does not consider public understanding
Considers uncertainty	Does not consider uncertainty
From respected source	From questionable source
Organized message	Lack of structure
Use of metaphors	Uninteresting formulation
Explicit conclusions	Receiver make own conclusion
Positive information in the beginning of the message	Negative information is emphasized
Person	
Accepts uncertainty	Not accepting
Responds to public feelings	Not interested
Seems approachable	Nervous
Public can relate	Perceived as outsider
Personally engaged	Arrogant, distanced
Perceived as expert	Uninformed
Perceived as sincere	Dishonest
Charismatic	Lacking self-confidence
Credible, honest, altruistic and objective	Deceitful, unconcerned
Institutions	
Positive personal experience	Negative personal experience
Strong, competent leadership	Bad leadership, incompetence
Positive contact with staff and public	Poor reputation, staff strikes
Good environmental policy	Irresponsible environmental policy
Safe and good production, services	Low production, bad services
Positive image about past activity	Negative image about past activity
Reasonable taxes	Exaggerated prices
Dealing with socially relevant tasks	Lack of attention to social issues
Benefits greater than costs	Costs and risks greater than benefits

There is an asymmetry in achieving and losing trust – it is hard to achieve it, but very easy to lose it. Trust can be created through an awareness and identification of shared values and agreement.

Informing and communicating about risks is more likely to succeed when treated as a two- way process, when participants are seen as legitimate partners, and when people's attitudes and "worldviews" regarding health, environment and technology are respected. This is particularly true in the case of a nuclear issue. Acceptance of risks is not a straightforward information or education issue, an opinion that often prevails in scientific/technical circles. It results instead from a communication exchange.

ROLE OF FEAR

Confronting fear, it is often more important how and how gives the information than what is really being said.

Organizations, governments or institutions should not think that delivering full information about a dangerous event would produce fear and panic. So they should not delay in giving out information via the best communication channels. They should give as much information as they can and must never misinform people about the situation. This will prevent panic and build trust.

EXPERT VS. GENERAL PUBLIC

Public tends to personalize the risk and scientist to depersonalize the risk.

It is important to note that risk and acceptability mean different things to different individuals. This variation in risk perception is important to understand because if communicators do not take into account differences between expert and public perceptions of risk, this may reduce the success of risk communication.

Experts define risk in terms of cause and effect relationships and attempt to quantify the amount of harm that can result from taking part in a given activity.

When members of the public decide on whether or not they consider a risk acceptable, they take account of several qualitative issues. In this way it is possible for low probability 'real risks' to be converted into 'perceived risks' with an apparent high probability during the process of someone forming his or her own risk perception.

HUMAN BEHAVIOUR IN EMERGENCIES

Contrary to the prevailing opinion connecting people's behavior in emergencies with panic flight, regression, selfishness, and irrational behaviors, the truth is quite the opposite. People in danger can be very brave and unselfish. They can usually behave functionally, rise to the situation, and support their family, neighbors, colleagues and strangers. The problem with warnings or informing people of an emergency is not in causing a panic flight; more commonly, a threatened population tends toward normalcy or doing nothing. So communicators should not be afraid to warn people immediately about danger – the warning will not cause panic, but will prepare and/or guide people. Timely and adequate warnings also give people a sign that the situation is under control. The reason for attributing irrationality and panic to human behavior in dangerous situations stems from failing to consider people's experiences, and what they know in such situations. It also depends on how they perceive the threat and whether they were warned in time. Panic reactions are actually rare, and therefore hesitation over whether to issue a warning (e.g. 'not to cause a panic') is not often warranted. In fact, people who have not been properly warned may be least likely to behave appropriately. Remember that family members want to stay together in their homes, especially parents and children, and this is both rational and understandable.

- basics for risk perception
- expert versus general public
- human behavior in emergency

6. RISK COMMUNICATION

Risk communication is any combination of actions, words and other interactions that incorporate and respect the perceptions of the information recipients. It is intended to help people make more informed decisions about threats to their health and safety.

Communication could be defined as a process of message exchange in a personal, cultural, and social context. Effective risk communications involve two parts: the **exchange process** and the **actual information** about the risk. The two-way exchange process fosters a dialogue between those who may be affected by the risk and those who are charged with controlling it. Both the circumstances of the emergency and public perceptions of the risks involved drive this exchange process.

Risk communication is not only about providing other people with "correct" information, but about creating a dialogue and taking the different risk perceptions into account. The dialogue is a precondition for the various actors to be able to solve the problem together.

For **effective risk communication**, one must determine the audience and the goal of the message, the channel and the communicator that can be used to reach the target audience, and one must be ready for feedback.

Risk communication primarily aims at:

- Informing and engaging the public.
- Encouraging behavioral changes and acceptance of protective actions.
- Issuing warnings about a danger and any necessary information.
- Exchanging information and establishing a common approach to risk.
- Risk governance.

The following factors in the communication process can be distinguished:

- *Source*: who delivers the message.
- *Message*: (verbal) information from the source.
- *Channel*: means or media of communication, used by the source.
- *Receiver*: audience to whom the message is intended.
- *Effect*: possible effects of message (e.g., transmission of information, attitude, or behavior. change, decrease of fear or uncertainty, short and/or long-term consequences).
- *Feedback:* communication should be a two-way process.

To achieve effective risk communication, systematic planning in the following areas is essential:

- Development of a communication strategy aimed at specific target groups.
- Creating public communications plan.
- Focusing on evaluation review as an integral part of communication.
- From feedback received, improving the planning phase of communication and tactical goals on which the communication plan is based.

- Training and improving communication skills.

In developing any emergency related messages or other information, the pre-existing knowledge about radiation of the target audience and their level of literacy must always be considered. Specific audience segments, such as seniors, children, the disabled, and non-native speakers, may need specific consideration.

Use simple grammatical structure, explain all technical or unfamiliar terms, and put the important facts up front. Because radiation is unfamiliar to many, explanations of basic concepts should also be included to provide a context and a rationale for the information being communicated.

As the emergency evolves, risk assessments may change, or facts may need to be updated. To reduce potential problems with consistency which can lead to a loss of credibility and trust, when information is changed, it should be clearly explained what has changed and why.

7. AUDIENCES / MESSAGES / CHANNELS

AUDIENCES

In communicating about radiation emergencies, it is important to note that the term "general public" is very broad and is best not considered as a single entity. The public is groups of people with their own interests, priorities and needs which may need to be addressed. A successful communication approach to one social group does not ensure that it will work well with another group. Therefore, for effective communication, the identification of all possible audiences should be made in the preparedness phase. Each emergency will have different audiences and these may even change during an emergency.

Audiences can be directly or indirectly involved in the emergency. Some of them may be more clearly and directly affected by the potential risks and consequently are dependent on the information communicated. Others may not actually be exposed to radiation but may claim to be interested or affected by the overall situation.

While only those exposed to radiation will be at real risk, others may be worried that they are also at risk. **Quickly communicating appropriate information to these two groups should be a priority.** Past experiences with radiation emergencies have shown that often the greatest drain on emergency medical resources is the "worried well"- people who seek medical attention when they have not been exposed or injured.

To reduce this likelihood, information about who is and who is not at risk must be clearly communicated. It should be noted that in the case of terrorism involving radiation sources, public concern may be heightened by uncertainty about the potential for future malicious acts. PIOs should plan how to deal with this increased anxiety both in the development of the information and messages and in how to communicate in circumstances involving terrorism.

TABLE 3 - POTENTIAL AUDIENCES

Potential audiences	**Communication needs**	**How to**
Population		
Those directly affected by radiation.		

Families and friends of those affected by radiation.	Perception management. Protective measures. Empathy and honesty. Identify and combat fake news and manipulative narratives	Clear instructions. Explanations using plain language. Frequent messages including updates, if possible. Monitor & analyze all media channels
Those who might be affected by decisions about protective actions.		
Those who use the infrastructure in the affected area		
Responders		
Emergency managers and first responders.	Intervention plans communicate in the preparedness. Clarity. Allocation of responsibilities. Coordination among institutions. One voice principle	
Those measuring radiation.		
Health professionals		
Those responsible for remediation of the contaminated area.		
Decision makers		
Local authorities	Real time, consolidated information. Transparency. Intervention plans communicated in the preparedness plans.	
National authorities		
Those not affected but who must be informed about the event by law, agreement or convention.		
Influencers		
Those who can promote decisions related to radiation protection.	Clear information.	
Those who might obstruct decisions related to radiation protection.		
Those who might suffer economically because of the emergency.		
Other organizations not involved in the emergency response but with a legitimate interest.		
Those seeking to visit the site of the emergency.		
Experts		

It is highly recommended to engage audiences in the preparedness phase. PIOs should concentrate on local relationships and interactions in order to understand the true drivers of trust, build it and maintain it.

Stakeholder groups have become a valuable way to involve the public in policy decisions. Successful stakeholder involvement will help to build trust, understanding and cooperation. If trust exists, or if trust is established, stakeholder involvement can be a very successful method of building confidence in other groups, resulting in more cooperation.

COMMUNICATION CHANNELS

Communications channels are used to transmit information, either en masse or targeted at specific audiences. Different audiences use and trust different channels, and the type of information should be appropriate to both the channel used and the intended target audience. Regardless of the nature of the emergency, different means of communication should therefore be available, ranging from landlines, mobile phones, e-mail and couriers to TV and radio stations.

News media can play a dominant role in all phases of an emergency. Not only are they the major information channel for the general public, communicating with various audiences, but they can also act as a "watchdog" for society by monitoring the emergency response. News media serve as a communication channel for the public both at the time of an emergency, and also later on - for example, during the clean-up of a contaminated site.

In an emergency, use of the local media can be the most efficient way to communicate with the local population. Multiple communication channels should also be considered; for example, messages can be targeted at young people via the internet and social media.

The PIO/Team varying degrees of control over different communication channels, as shown in Table 9.

TABLE 4 - CONTROL OVER COMMUNICATION CHANNELS BY PIO/TEAM

	Degree of organizational control		
Channels	Most control Organizational tools	Less control Mass media	Least control Informal channels
Electronic	Web pages, call center (hotlines)	TV, radio, media web pages	Mobile, phone, personal websites
Printed	Leaflets, fliers, brochures	Newspapers, magazines	Leaflets from other organizations /parties, letters
Personal contact (face to face)	Public meetings, personal warnings, PIC	Interviews, briefing centers	Meetings organized by other organizations /parties, visits

8. GUIDELINE FOR POPULATION: A LEAFLET WITH AT LEAST FOLLOWING TOPICS WILL BE DEVELOPED

- Introduction
- What to do if taking shelter is recommended?
  - ENTER THE SHELTER
  - STAY IN THE SHELTER
  - STAY INFORMED
- What to do if evacuation is recommended?

- NECESSARY ACTION
- PROTECT YOUR HOUSE
- RECOMMENDED ACTIONS (IF ONLY IF YOU HAVE SUFFICIENT TIME)

- The effects of radioactive iodine on the body (What is important to know about potassium iodide KI)
  - POTASSIUM IODIDE:
  - WHEN TO BE ADMINISTERED
  - HOW MUCH IS ADMINISTERED?
  - CONTRAINDICATIONS
- What you can do to be safe
  - GET READY
  - TO DO DURING EMERGENCY
  - STAY SAFE AFTER

9. ANNEXES

9.1. PLAIN LANGUAGE

9.2. GENERAL ACTIONS FOR PIO/TEAM IN AN EMERGENCY

9.3. KEY PUBLIC COMMUNICATIONS ACTIVITIES

9.4. PRACTICAL ARRANGEMENTS FOR THE PIO

9.5. INTERVIEW INSTRUCTIONS

9.6. DEVELOPING MESSAGES FOR THE PUBLIC

ANNEXES 9.1. PLAIN LANGUAGE

NUCLEAR AND RADIOLOGICAL TERMINOLOGY

TERM	DESCRIPTION

Activity	The measure of the strength (intensity or activity of a radioactive source. Measured in Becquerel (Bq).
Becquerel	The universal term for unit of radioactivity, equal to one transformation (decay) per second
Beyond Design Basis Accident	Accidents involving significant core degradation. The probability of occurrence of a such accidents are very low, it .
Containment	A container or structure that keeps radioactive materials from being released into the environment.
Contamination	Any radioactive material where it is not intended and wanted to be.
Decay	A transition process of an atom from its unstable to stable form accompanied by release of energy.
Design Basis Accident	Accident foreseen by the design. .
Dose	The measure of the health effects hazard to humans from exposure to radiation. Measured in Sievert.
Dousing	A large spray of water used to reduce the steam inside the reactor building containment.
Exposure to radiation	When the body's tissues are damaged by radiation. Exposure can occur when the source of radiation is outside the body or inside the body.
Facility Emergency	An event has occurred leading to higher radiation levels that are established to the installation.
Fission	The physical process of splitting apart an atom to release a huge amount of energy (heat) and some neutrons that could go on to split apart other atoms.
Fuel Bundle	Sealed assembly of long slender metal tubes that contain nuclear fuel material capable of splitting into parts (fissionable) which provides heat, leads to more fission and creates new radioactive materials.
Fuel Failure	Any form of damage that would allow radioactive material to be released from a sealed fuel bundle.

General Emergency	An event involving an actual or substantial risk of release of radioactive material or radiation exposure that warrants taking urgent protective actions outside the boundary of the Cernavoda site.
Heavy water	Water used for cooling in nuclear reactors, it contains a special form of hydrogen.
Hydrogen	Gas released inside the reactor building during a severe accident. Too much hydrogen gas in one place can be explosive.
Potassium Iodide (KI)	Tablets that can be administered to people during an emergency. They contain non-radioactive iodine used to saturate the thyroid gland with safe stable iodine to diminish the probability of developing cancer
Neutron	Small nuclear particle contained in the nucleus in an atom and used to start nuclear reactions. Neutrons are neutral and don't carry an electric charge.
Noble gases	A type of radioactive gas that may be released during a nuclear accident. e.g., Xenon,
Plume Nor radioactiv	Radioactive gases and dust drifting through the air (by wind) which can eventually settle on surfaces far away from the plant.
Radiation	Energy released from unstable atoms. Its usage benefits or harmful effects depend on a myriad of factors like type, intensity, dose etc
Radioactivity	Radioactivity is **the act of emitting radiation spontaneously**. Unstable form of an atom emits energy in order to return to its stable form.
Radioiodine	A radioactive isotope of iodine that could be released from nuclear stations during an accident. It can be absorbed by the thyroid gland and this is avoid by the intake of iodine tablets.
Reactor core	An assembly of nuclear fuel, water, and control systems that under the right conditions, leads to nuclear fission and becomes the source of heat in a nuclear power plant.
Release	When radioactive gas and dust are let go intentionally (controlled) from containment to the environment to reduce the pressure in the containment or escape unmonitored (uncontrolled). . A filtered release passes the gas through filters

	that restrict some of the radioactive particles, whereas an unfiltered release would not.
Severe accident	Damage that threatens the integrity of the reactor core and could lead to a release of radioactivity to the environment.
Shutdown System	A solid or liquid that is added to the reactor core that stops the nuclear reaction.
Radioactive Source	A gas, liquid, or solid material that is radioactive (consists of unstable atoms)
Spent fuel	A fuel bundle that has spent some time in the reactor core undergoing fission and is producing heat. Spent fuel is highly radioactive.
Sievert (Sv)	Measure unit of exposure (see definition of dose). Sub-multiples are often used: micro [μ] (one-millionth) anomaly [m] (one-thousandth)
Venting	A way of releasing excess pressure from containment.

NUCLEAR AND RADIOLOGICAL ACRONYMS

ACRONYM	DESCRIPTION
AIEA	Agentia Internationala pentru Energie Atomica
ALARA	As low as reasonably achievable – a principle of radiation protection to ensure that radiation doses are minimized.
CANDU6	**CAN**adian **D**euterium **U**ranium - a reactor type that uses heavy water as moderator and coolant. 6 is the model number. Cernavoda is a CANDU 6 type reactor
CCIP	Centrul de Comunicare si Informare a Publicului
CNCAN	Comisia Nationala pentru Controlul Activitatilor Nucleare
CNCCI	Centrul National de Comand si Coordonare a Interventiei
CNE	Centrale Nuclearoelectrice
CNPP	Cernavoda Nuclear Power Plant
CNSSU	Comitetul National Special pentru Situatii de Urgenta

COCG	Centrul Operational de Comanda al Guvernului
COSU	Centrul Operational pentru Situatii de Urgenta
DPE	Distanta de Planificare Extinsa
EC	Emergency coolant injection - system that provides cooling to the reactor core in the event of an emergency.
ECC	Emergency core cooling
ECURIE	European Community Urgent Radiological Information Exchange
EOC	Emergency operations center - a location designed and equipped for coordinating emergency response measures.
EOP	Emergency operating procedure - a procedure to be followed during an emergency.
EURDEP	European Radiological Data Exchange Platform
EPZ	Emergency Planning Zone
ERO	Emergency response organization (CNCAN, MolA, CNCCI...) - any organization that is involved in the response to an emergency.
ICPD	Distanta de Planificare pentru Restrictie de Consum Alimente si Utilizare Bunuri
IRMIS	International Radiation Monitoring Information System
LOCA	Loss of coolant accident - a type of accident at a nuclear plant that could lead to the overheating of nuclear fuel.
LPZ	Longer-term Protective Action Zone
MADR	Ministerul Agriculturii si Dezvoltarii Rurale
MAE	Ministerul Afacerilor Externe
MAI	Ministerul Afacerilor Interne
MApN	Ministerul Apararii Nationale
MS	Ministerul Sanatatii
NPP	Nuclear power plant - in essence, a facility that employs a nuclear reactor as a controlled source of heat to make steam to turn a turbine to generate electricity
OIL	Nivele de Interventie Operational
PAZ	Zona Preventiva Operationala

PHWR	Pressurized heavy water reactor - a type of nuclear reactor used in Canada, called CAN DU, that runs on a much simpler form of uranium fuel.
PN	Punct de Notificare
RDD	
RNMRM	Reteaua Nationala de Monitorizare a Radioactivitatii Mediului
RODOS	Real-time Online DecisiOn System
SAMG	Severe accident management guidelines
SCIP	Strategia de Comunicare si Informare a Publicului
SDS1	Shutdown system 1 - an automatic system where long solid rods are quickly lowered into the reactor-core to absorb the neutrons and stop the nuclear reactions.
SDS2	Shutdown system 2 - an automatic system where a liquid is added to the water around the nuclear reactor which acts to absorb neutrons to stop the nuclear reaction.
SNMSU	Sistemul National de Management a Situatiilor de Urgenta
TLD	Thermoluminescent dosimeter - a portable device used to measure the dose of radiation an individual has received over a period of time.
UPZ	Urgent Protection Zone
USIE	Unified System for Information Exchange

Annex 9.2. GENERAL ACTIONS FOR PIO/TEAM IN AN EMERGENCY

- Receive a briefing from the IC.
- Establish communication line between PIO and radiological assessor/team to provide ongoing consultation and advice on dealing with the radiological hazard and appropriate response actions to emergency.
- Take all practical steps to provide the public with useful, timely, truthful, consistent and appropriate information throughout the emergency.
- Prepare, in cooperation with law enforcement team, for immense media attention including the arrival of reporters at the scene.

Confirm with the IC that you are the official source of public information and inform the on-scene responders, law enforcement, hospitals, local government and national Emergency Operation Centre (EOC) to refer media inquiries to you.

- Develop with the IC and issue a press release - describing for example:

- The threat;
- Appropriate and inappropriate public response actions; and
- Actions being taken to ensure public safety, protection of products, etc.

- As soon as possible, establish a PIC where media briefings from a single qualified spokesperson or a panel with representatives of all organizations involved in the response will be provided. Include representatives of local and national governments in briefings.
- Assess the needs and request additional resources.
- Prepare for national and international inquiries and combat the rumors.

Annex 9.3. PRACTICAL ARRANGEMENTS FOR THE PIO

Logistical arrangements for setting up the PIO response team should be developed in advance, along with all necessary procedures. Some required capacities during a radiation emergency include:

- Follow national, regional public communication plans and associated procedures- roles, responsibilities.
- Follow Plan/arrangements for coordinating public communications/media relations with bordering countries.
- Maintain roster of staff involved in public communications in emergency response Activate full public information response (even in the absence of formal activation of national emergency response) and required technical and administrative support.
- Ensure functionality of dissemination capabilities (fax distribution services, listserv) for press releases, public information notices, protective actions, etc.
- Monitor the media (national and international).
- Ensure staff is coached for dealing with the media.
- Maintain roster of media trained spokespersons.
- Draft fact sheets and questions and answers.
- Maintain maps and illustrations.
- Ensure translation capabilities.
- Use templates for delivering statements, press releases, speaking points etc.
- Establish toll free number for public calls.
- Ensure logistics and procedures are in place to establish dedicated Public Information

Centre (PIC) when necessary.

Annex 9.4. KEY PUBLIC COMMUNICATIONS ACTIVITIES

During an emergency, the PIO is responsible for keeping the media and public informed and coordinating with all sources of official information to ensure that information provided to the media/public is consistent, accurate and timely. Depending on the complexity and duration of the emergency, this function may be undertaken by an individual or group.

Key public communications activities during an emergency include:

- **Strategic Planning** - to develop the emergency specific communications strategy. This strategy should include at a minimum an analysis of the current public environment, identify any strategic issues that may affect how communications is undertaken, consider key messages and information to be communicated and why, develop the overall approach to communications and propose communications tools and information products to be used.
- **Media Relations** - to provide information to the media, to organize news conferences and technical briefings, to issue press releases, to correct rumors and to coach the spokesperson.
- **Media Monitoring** - to monitor traditional print and electronic media as well as new social media sources for accuracy of information.
- **New Media** - to develop information products and visuals for the internet and new social media sources.
- **Liaison and Coordination** - to coordinate information/messages and release of all information with other organizations, other levels of government, international agencies, and other relevant organizations.
- **Public Communications** - to provide information to the public through information products, information centers, telephone hot lines, email, and public meetings.
- **Internal Communications** - to keep employees informed about the emergency and what the organization is saying to the media and public about the response. (Due to high workload to address demands from the media/public, this may have to be delivered by another group - such as human resources/personnel).

To be effective, these public communications activities will have to be supported by appropriate experts who can provide technical advice in the development of all media/public information. The media spokesperson(s), usually technical experts who are both credible and good communicators, will also need to be designated. To maintain consistency, the number of spokespeople should be kept as small as possible, depending on the workload. During an emergency, demands from media, local, national and international will be intense and it is not feasible for one person to take on this role on a 24/7 basis. Where multiple spokespersons are used, it will be vital to ensure that information provided is consistent. Any inconsistencies may be picked up by media and could undermine the credibility of the emergency response.

Public communications in an emergency are more effective if steps are taken in advance. This includes not only establishment of plans, procedures and responsibilities, but research into public attitudes, design and pre-testing of messages, and even pre-emergency communication to increase target audience and media awareness to help them be prepared should an emergency occur.

During the preparedness and post-emergency recovery phases, time allows for the testing of messages, and surveys of public attitudes. This detection system is every bit as important as radiation detection testing of an affected site. Emergency responders do not guess at radiation levels at a contaminated site. Nor should PIOs guess at public attitudes. As time allows, these attitudes, the efficacy of actions and messages, should be tested, and revisions should be made as required.

Annex 9.5. INTERVIEW INSTRUCTIONS

WHEN A JOURNALIST CALLS ask:

- Will the interview be broadcast live or recorded?
- Who else will be interviewed?
- How long have you got for answers to questions? (E.g. 20 seconds per answer).
- Where and when will the interview be broadcast / published?
- What type of programmer will the interview be used in?
- Negotiate any special requirements well before the interview (e.g. when and where).
- You always have right to say no, but remember the public have a right to know.
- You don't need to answer all questions. Give your core message.
- The interview should be an opportunity to get an important message to the public.

DURING AN INTERVIEW:

- Be brief, clear and simple (e.g. 20 seconds per statement).
- Be self-confident.
- Be truthful. If you cannot answer a question, give the reason why or indicate who the question should be put to.
- Always include your message in an answer irrespective of particular questions.
- Don't theorize or speculate.
- Speak only in your field, about things you know.
- Answer only the questions put about the emergency, not any general statements.
- Never use the phrase: "No comment." (If necessary, explain *why* you can't comment.)
- Keep cool and avoid any heated exchange.

BEFORE TV INTERVIEW

- Talk to the journalist and try to establish some personal contact. Talk to the journalist about the broader aspects.
- Ask the journalist to tell you the questions – word for word.
- Take time to think over your answers before the interview.
- Remember the core messages you intend to put out.
- For TV, check the interview background. The surroundings can be a message too.

DURING TV INTERVIEW

- Take time to answer questions but stick to the point or message.
- Try to keep your answers short (e.g. 20 seconds per answer).
- Don't just say "yes" or "no". Explain and include your message.
- Don't fold your arms.
- During an emergency, the interview could be outside. If so, agree to be standing, not sitting.
- Behave naturally and try to enjoy the interview.
- Try to answer clearly, just as you would to a friend or relative who wanted your opinion or some information.
- If it is a recorded interview, you can always ask for a question to be repeated.
- Remember that the camera or microphone may be running before and after the interview.

WHAT THE MEDIA WILL ASK DURING AN EMERGENCY

As applicable to the situation, be prepared to respond to questions about the following:

A. Descriptions of the emergency

- Cause of the emergency.
- When it happened.
- Extent of the emergency.
- Extent of any releases, spills, blasts, explosions.
- Levels of radiation and hazardous materials released.
- Description of odors or color of flames.
- Attempts at rescue or escape.
- Soundness of structures, systems, equipment. Status of other units at site.
- Power supply implication or effects and communication lines.
- Generic implications.
- Preliminary or tentative INES level assigned.
- What the next steps will be.

B. Response efforts

- How emergency was discovered.
- Who sounded alarm and called for help?
- What agencies have responded to the emergency?
- What agencies are expected to respond?
- Forewarnings; prior indications of emergency.
- Status of plant at time of emergency (in case of NPP emergency).
- Current status of plant and of the response (in case of NPP emergency).
- Interview opportunities with participants, witnesses.
- Interview opportunities with key responders (operators, fire, police) and company executives.
- Interview opportunities with experts.

C. Property/equipment damage

- Description of damage – kind of building(s), plant, equipment.
- Estimated value of loss.
- Significance of damage (to the continued safe operation or shutdown of the plant).
- Other property or buildings threatened.
- Previous emergencies associated with the facility or site.

D. Casualties

- Number killed, injured, missing.
- Nature of injuries received.
- Care given to injured.
- Whether or not injured were contaminated.
- Where injured were treated, decontaminated.
- Job description of anyone who was killed, injured, or escaped.
- How escape was completed, handicapped or stopped.

E. Relief efforts

- Number evacuated from site.
- Number involved in rescue and relief.
- Equipment used.
- Obstacles to correcting the problem.
- How problem was prevented from escalating. Acts of heroism.
- Capabilities of off-site agencies to respond.

F. Public Protection and Health Consequences

- Will the public be affected?
- What protective action has been taken?
- What was the basis for any decision on protective action?
- Who decided what actions the public should take, and where are they based?
- Will there be radiation-induced illnesses (e.g. increases in number of cancer cases)?
- Definitions of exposure terms.
- How time, distance, shielding provide safety.
- What does shelter mean?
- What does evacuation mean?
- Why are livestock sheltered?
- How long are these measures likely to continue?
- How did decision makers learn of plant status?
- What methods have been used to educate the general public before and during the emergency?

Communicators should be also prepared to face questions about legal and financial implications of an emergency. Responses to such questions need to be carefully prepared, as unguarded comments from the side of communicators could have serious legal and financial implications.

Annex 9.6. DEVELOPING MESSAGES FOR THE PUBLIC

All messages, written and verbal, should be prepared carefully, keeping the principles of risk communication in mind. Templates for messages are provided in Appendix .... Preparing templates in advance will facilitate developing and distributing messages in an emergency. Messages should be primarily factual. The public will want to receive authoritative and reliable facts and figures.

For written messages, the content (nature of emergency, statement about the danger, consequences, and instructions) and form (understandable, concise, and factual) are key. Written messages should:

- Describe the radionuclide and the type of radiation involved in the emergency. Describe also the possible pathways by which people could be exposed to radiation.
- Give estimates of radiation doses, if possible, and explain how they might compare with doses from other sources of radiation, such as natural background radiation or medical practices.
- Explain the possible health implications of the doses received.
- Describe how people might be able to reduce radiation doses, sheltering being a prime example.
- Make clear the areas where populations might be affected and those where people are not (or are unlikely to be) affected.
- Provide consistent, concise and clear advice. During a prolonged emergency, issuing information at a regular time will help people cope with the effects.

- Provide reliable information and clear advice on protection.

In addition, verbal messages should:

- Be simple and understandable (avoid jargon and complex terms).
- Be brief, concise and clear (3 key messages, 9 seconds, about 30 words only).
- Meet people's needs and concerns (inform about the threat and necessary actions). Be truthful, without speculation, providing the facts.
- Promise only what can be done.
- Not blame others.
- Explain why some information may not be available.

In preparation for a radiation emergency it is helpful to have prepared statements or information factsheets on the following topics:

- How does radiation travel (e.g. via a plume, wind, air and water)?
- How can radiation be spread (via natural processes, people, animals, vehicles)?
- How far can radiation travel?
- Will radiation contaminate water and food supplies?
- How long will the contamination last?
- How are radiation levels determined?
- How is radiation levels monitored?
- What are the symptoms of radiation exposure?
- How do individuals know if they have been contaminated or not?
- What can individuals do to protect themselves?
- What are the short- and long-term effects of contamination?
- How will the sick and injured be treated, and can the hospitals cope?
- What is the possibility of becoming cross-contaminated (from other people)?
- How can I get further information related to the emergency? (Including help lines etc.)

In the event of an emergency, this background information can be released as appropriate via the media and by website, telephone hotline, physical distribution etc.

Annex 9.7. QUESTIONS AND ANSWERS

Types of predefined questions and answers

Consider developing some questions related to other types of events

- Lost source – how to recognize radioactive source (trefoil sign, heavy container, …), what to do if someone encounters such an object,….
- RDD – what does it mean, what might be its main consequences, who would respond and how;
- Overexposure – how, can it happen, what would be the symptoms, ...

1. What happened, where and when?

The reply must provide, summary, data on the affected installations (or, if there is more than one), location, date and time of the event and the current status of the installations.

2. There has been damage human and/or material damage?

It should be noted if there is any damage human and/or material damage. In case of nuclear installations accident, is very likely to be both: material damage and human damage.

3. How harmful are the material placed in circulation?

We suppose that the question refers to the potential emissions of radioactive materials in case of nuclear installation accident. The radiological consequences of such an event can range from insignificant emissions until significant release, depending on the situation. The state's nuclear and radiological consequences of an accident can only be assessed in a real situation, otherwise there are a multitude of possible scenarios and impacts ranging from minor to very high. As a general rule, they (who are they?) there must be taken all practicable measures to minimize exposure to radioactive materials.

4. Which are the dangers for the people and the environment?

Dangers to the population and the environment can be assessed specifically only in a real situation, otherwise there are a multitude of possible scenarios and impacts ranging from minor to very high. Exposure to ionizing radiations includes both external exposure and internal exposure, resulting from inhalation or ingestion (absorption also) of radioactive materials.

Generic hazards due to emission of radioactive materials are:

A) The risk of inhalation of air contaminated radioactive gas emitted is due to transport radioactive substances, which leads to the manifestation of the combined effect of inhalation and irradiation. In case of emissions from a nuclear installation whose active area was damaged and it cannot ensure the retention or filtering emissions, the immediate risk occurs due to inhalation of radioactive iodine on the thyroid acting inhalation and other fission products.

B) Risk resulting from deposited radioactivity. Risk assessment is done by determining the level of radiation and radionuclides present setting. Depending on the time of ordering food for radioactivity control depends on the risk of ingesting, the greatest danger is from radioactive deposit on foods that can be eaten without being washed vegetables, fruits, drinking water, feed etc. Consumption of milk and some foods can be eaten without being checked, including meat and offal of animals and birds, shows the indirectly danger.

C) Risk resulting from the low activity accumulation. In this case attention must be focused on food stuffs for people that may be contaminated with the most dangerous radionuclides. The air and precipitation radioactivity must be controlled permanently. If the effect of inhalation occurs quite rapidly, due to the danger of radioactive deposits and medium term is high, which requires long-term measures on water, food and feed.

5. Is there an immediate danger?

- People are being told to evacuate or stay inside (shelter-in-place) because exposure to the radioactive material outside is potentially dangerous.
- If you were instructed to stay inside, remain inside until you are told otherwise by local authorities.
- Having walls, brick, concrete, or soil between yourself and the source of radiation can help reduce your radiation dose.
- If you were instructed to evacuate, please do so immediately, following instructions of emergency officials.
- Instructions may be updated based on location and situation.
- Instructions given by local or State officials are for your safety.
- Continue to stay tuned to official channels for the most up to date information.

6. What kind of emergency measures must be taken?

Emergency measures include sheltering, administration of potassium iodine pills, evacuation and even the long term relocation. The measures must be applied gradually depending on the severity of the emergency situation. The measures are divided by CNSSU

Currently there are many documents, brochures and guides that show protection measures for the population (see links below) and the ideal would be to have a single guide.
http://www.cne.ro/Up/files/downloads/pdf/PlanUrgenta_Brosura_v13.pdf;
http://www.nuclear.ro/ro/Files/GHID_de_comportare_in_caz_de_accident_nuclear_sau_urgenta_radiologica.pdf;
http://www.igsu.ro/documente/informare_preventiva/ghid_cetatean_SU.pdf (P28-29);
http://www.satu-mare.ro/fisiere/ancora_pagini_fisiere/Masurispecificedeprotectiesiregulidecomportareapopulatieiincazdeaccidentnuclearsiurgentaradiologi.pdf;
http://www.isudolj.ro/wp-content/uploads/2013/01/OMAI-279-2010-interventii-urgente-radiologice-si-nucleare.pdf;
http://www.insp.gov.ro/cnmrmc/images/pdf/domenii/radiatii-naturale-profesionale/Material_Informativ_Radiatii_Ionizante.pdf

7. What effects has this had on the people in the affected communities?

- While it is too early to know the specific impacts, we know that there has been a serious incident that has significantly affected many people, disrupted lives, and may have caused numerous medical issues.
- We will do everything we can to help the people affected.
- As we continue life-saving and protection activities, we urge people to follow the instructions of State and local officials and responders.
    - These instructions are being broadcast over TV, radio, websites, and throughout other means.
    - These instructions are based on the best information we have right now and may be updated based on your location and as we gather more information.
    - These instructions are for your safety.

8. What we need to do if we are in an open space?

If we are in an opened, we need to go inside and we must remain in the space and make sure that doors and windows are tightly closed.

9. What we need to do if we are in a closed space?

If we are in an closed space, we need to stay down in the closed space. If we are in a closed space, we must remain in the space and make sure that doors and windows are tightly closed.

10. What we need to do if we are in a public transport?

If we are in a public transport, we must leave the vehicle and we need to find a place for shelter in place and follow the instructions of public authorities.

11. Who should evacuate and who should go inside and stay inside?

- As stated by [insert official], people in [area/location] should evacuate and people in [area/location] should go inside and stay inside (sheltering).
- Officials work with experts to determine the actions that will keep exposure to the public as low as possible.

- Local officials' number one priority is to protect people from exposure to potentially dangerous levels of radiation.
    - Depending on specific conditions, radiation levels can be dangerous.
    - The two main protective actions are evacuation (leave the area) and sheltering-in place (go inside and stay inside).
    - These decisions are based on radiation science and other important factors such as direction of the wind, other meteorological conditions, amount and type of radioactive material released, and how quickly radiation levels decrease.

12. What should people do if they're told to evacuate?

- If you are told to evacuate, leave the area immediately
- When the public evacuates, they are moved to safer areas depending on levels of radiation and radioactive material in order to keep exposures as low as possible, and under most conditions evacuation is preferred.
- If you are told to evacuate:
    - If available, follow the detailed instructions provided to you.
    - Pay close attention to what officials are telling you.
    - Take the designated routes to reception centers where you will be registered and checked for contamination.
    - Transportation will be provided to those who need it, including physically accessible transportation for people with disabilities. Limit calls to emergencies only, so those who need immediate help can be addressed in a timely manner. Text messaging may work during high volume periods because it does not require as many system resources.
    - Follow the instructions of law enforcement personnel

13. What should people do if they're told to shelter-in-place?

- If you are told to shelter-in-place, go inside a building immediately.
- Sheltering-in-place may be ordered in some cases.
- In some situations sheltering-in-place may provide protection that is equal to or even greater than evacuation, such as in cases where weather, traffic, competing events, or short-term releases are factors.
- During a relatively short-term release, the population may be instructed to shelter-in place, such as at home, a workplace, school, or shopping mall.
- Keep listening to your radio or TV for updated instructions.
- These instructions may conflict with your natural instinct to evacuate from a dangerous area; however, health risks from radiation exposure can be greatly reduced by:
- Putting walls, brick, concrete, or soil between you and the radioactive material outside, and
- Increasing the distance between you and the exterior walls, roofs and ground, where radioactive material is settling.
- Individuals who are sheltering-in-place will be instructed to leave the area as soon as the risk from exposure decreases.
- Please follow instructions from emergency officials.
- Whether you are told to stay inside (shelter-in-place) or evacuate, these instructions are meant to limit your exposure to radiation and minimize your risk of contamination.
- The decision to evacuate or stay inside (shelter-in-place) is made by emergency officials using the best technical information available to them.

14. What should people do if they are told to stay inside but do not have food, water, or medications?

- Continue to remain inside for as long as you can until you receive additional instructions from authorities.
- Staying inside will help protect you from the radiation and other hazards associated with the incident
- Please remember that leaving your location may expose you to additional radiation.
- Once authorities provide instructions that it is safe to go outside, quickly but safely proceed to designated assembly areas or shelters if you require food, water, or medical attention.
- For food or water concerns:
- Authorities are aware of the limitations in food and water and are making efforts to resolve these issues.
- For needed medication concerns:
- Stay sheltered for as long as possible.
- If the lack of medication(s) creates a life-threatening condition that requires immediate medical attention, please call 112 or proceed to the nearest fire station, hospital, or medical triage area for assistance.
- For non-life-threatening medical care:
- If you have injuries or an illness that do not require immediate medical attention, please remain in your shelter until you are told it is safe to proceed to your nearest fire station, hospital, or medical triage area for assistance.

15. Who makes the decision for people to shelter-in-place or evacuate if an emergency occurs?

- The State (or in some cases, a county or local official) makes the decision, based on information from the NPP. The State (or local) officials may discuss the situation with CNCAN and seek its advice, but the ultimate decision is the responsibility of [State (or local) officials] who have the most accurate information and know the local situation best.

16. How do people learn if they need to shelter-in-place or evacuate?

- Persons located within about a 5 km radius of a nuclear facility will be alerted by means of sirens, Tone Alert Radios (TARs), and similar alert mechanisms.
- This lets them know to turn on their radios, TVs, computer, or other means for detailed instructions.
- Persons living in the vicinity of an NPP should have received updated information, with instructions that they should follow (meaning those in 5 km radius of PAZ or further?).

17. Are there shelters available for people who are evacuating? It seems that shelter here means alternate accommodation. Please consider using other term not to be confused with the measure of sheltering.

- Yes, designated shelters have been opened.
- Most are managed by the local authorities and GIES.
- You should first go to the reception center to be checked for contamination, and then to a shelter, or you can stay at a hotel or with family or friends. If you are in the Emergency Planning Zone, this is listed in the available emergency materials.
- Even though shelters provide water, food, medicine, basic sanitary facilities, and disability related assistance/functional needs support services, you should plan to take your prescription medicine and disaster supplies kit with you so you will have the supplies that you need. If you are in the EPZ, these are listed in the available emergency materials.

18. What's being done to protect schoolchildren?

- Following their plans, schools were evacuated in advance of the general population and the children were relocated to their designated host schools, as indicated in the emergency

information materials provided locally.
- They are safely under the care of their regular teachers.
- Parents should not go to their children's school to pick them up but to the host school once instructed to do so. This will ensure your children are there when you arrive.

19. What's being done to protect people in hospitals and nursing homes, and people at home who are too sick or don't have transportation?

- Family members, neighbors, or local emergency management agencies ensured appropriate provisions to evacuate those who cannot care for themselves.
- Nursing homes, hospitals, and other care centers have their own plans either to evacuate or shelter in place, depending on the circumstances.
- If you need assistance evacuating, please contact _____.

20. Is the food safe to eat?

- If you are concerned about the safety of your food:
- Wash your hands with soap and water before handling food. This will help remove any radioactive material that might be on your hands, limiting its spread to your food.
- Use a damp towel or cloth to clean all cans, bottles, packaged foods, counters, plates, pots, and utensils before using them.
- Seal these towels or cleaning cloths in a plastic bag and place them away from people and animals.
- In order to keep radioactive material from falling on areas that you already cleaned, remember to work from the higher areas to the lower levels.
- Food in sealed containers and any unspoiled food in your refrigerator or freezer is safe to eat.

21. Can people eat food from their gardens or locally caught fish and game?

- Do not eat food from your garden if you suspect that radioactive material has settled on it.
- It is possible that the radioactive fallout has contaminated the ground and any crops that were planted.
- Locally caught fish and game should be tested for radioactive contamination before it is eaten. Local response authorities will be testing fish and game and will notify you when it is safe to eat.
- Listen for instructions from State and local officials and responders regarding food safety.

22. Is the water safe to drink?

- Until we have drinking water test results, only bottled water is certain to be free of contamination.
- You can safely drink water, juices or other drinks in sealed containers or in your refrigerator or freezer.
- A sealed package or storage location will protect the liquid inside from radioactive contamination.
- If a sealed container was exposed to radioactive dust outside, use a clean towel to wipe off the bottle to remove any radioactive material before opening it.
- Tap or well water can be used for cleaning yourself and your food.
- The risk from having radioactive material on your body or consuming radioactive material on your food is significantly reduced by washing, even if the water itself is contaminated.
- Boiling tap water does not get rid of radioactive material.
- If needed, water in a toilet tank or from a hot water heater tank will also be free of radioactive contamination

23. Is the air safe to breathe?

- The radioactive material released in the air can give a radiation dose.
- Please follow safety instructions provided by State and local officials and stay tuned because instructions will change as they receive new information.
- Covering your mouth and nose with a protective layer – like a mask, cloth, or towel – can help reduce the amount of particles you breathe.
  If you have been instructed to stay inside, it is because walls can provide protection from the radioactive material outside.
- If possible, close windows/shut off HVAC that brings in outdoor air until the
- plume has passed.
- We are tracking the radiation levels and authorities will instruct you to leave the area when it is in your best interest to do so.
- Federal, State, and local partners are monitoring to determine the location and levels of radioactive material on the ground and in the air.
- Weather will be a major factor in determining where the radioactive material goes because it is carried by the wind as it moves through the atmosphere and can deposit based on wind speed and be brought to the ground by precipitation such as rain or snow.
- We will work with State and local officials to release the monitoring information to local responders and the public as soon as it is available.

24. When will it be safe for people to return to their homes and businesses?

- Federal, State, local, and tribal partners are collecting information about the impacted areas to determine the extent and levels of contamination.
- Until this is done we cannot predict when people can begin returning to the area.
- Local and State officials will use the information collected to determine appropriate safety measures for people in their jurisdictions.
- If you have been evacuated, do not return until you are told it is acceptable to do so by authorities.
- Please do not put yourself in danger by attempting to return early.
- Attempting to return early could divert responders' efforts away from those who need immediate assistance.
- A long, difficult cleanup may await us and the most important goal of the cleanup is to protect public health.
- This radioactive material release has created areas where radiation could be dangerously high.
- It may be months or years before the most contaminated areas are reoccupied.
- Certain people with special requirements – for example, those who need to milk or feed livestock, shut off major machinery, or retrieve medications – may receive special permission to enter certain areas for brief periods.
- Law enforcement personnel are at access control points to screen people who have permission to return.

25. How can people learn about the safety of other family members?

- At this time, responders are in the process of gathering and organizing all vital information available.
- Registries are being set up at evacuation centers.
- The ..... and other organizations are actively involved.
- We encourage you to seek additional information and/or counseling services at

26. What is being done in response to the release of radioactive material?

- The [unit/plant] has been shut down and, as it cools, the source of the radiation will diminish.

- Highly skilled teams are at the plant working to shut off the path of the release to the environment.
- It is still early in the response, and our focus is on protecting public health and safety.
- Specialized teams are inside and outside the plant boundaries assessing the nature and extent of the incident, damage to the nuclear power plant, and radioactive contamination that may have been released.
- Federal, State, local, and tribal responders are coordinating closely to respond as effectively as possible.
- Responders are working to protect those in the path of the release.
- We believe all those in the immediate downwind areas have evacuated to safety or are staying indoors (sheltering-in-place) as instructed.
- The release has created some areas where the levels of radiation are too high for responders to enter at this time.
- State and local officials have issued safety instructions.
- We are asking people to follow these instructions and stay tuned.
- Instructions may be updated as we get more information.
- These instructions are for your safety.

27. Who is responsible for managing the response?

- State, local, and tribal emergency officials are in charge of the immediate response.
- They know the local situation best and have trained responders and plans in place to manage the response.
- A number of Federal (check all answers for the use of terms federal and tribal) agencies are assisting, particularly with assets unique to the Federal government.
- We are coordinating to maximize our assets and respond as quickly and safely as possible.

28. What is the Government doing to respond?

- State, local, and tribal emergency officials are in charge of the immediate response. The Government is assisting with all the resources it has.
- TheGovernment, State, local, and tribal responders are coordinating closely to respond as effectively as possible.
- Federal responders from across the country have deployed [are being deployed] and officials continue to coordinate resources.
- The Government is following existing emergency response plans for maximizing resources, coordinating across all levels of government and helping those in need.
- Agencies and responders at all levels have conducted many drills and exercises and are well trained and equipped to respond to this incident.

29. Is it safe for emergency responders to enter the contaminated area?

- We imperative to keep our responders safe so they can do their job, which includes protecting people and providing security.
- For their own protection, emergency responders may be asked to enter contaminated areas for only a limited amount of time, or with special equipment.
- Guidelines established by radiation experts are used by emergency responders to determine where they can go and how long they should stay.
- Special devices measure levels of radiation or radioactivity in various areas so emergency responders can determine if and how long they should stay in contaminated areas.
- As radiation levels decrease over time, we will assess and revise our response efforts.
- We will keep you updated on the situation.

30. Can the contaminated areas ever be cleaned up and returned to their former use?

- Right now we are focused on assuring the health and safety of all those affected, and making sure they are kept out of harm's way.
- Affected areas are being cordoned off until we determine the locations and the levels of radiation.
- As soon as the immediate emergency is over and the plant is fully stabilized, we will carefully assess the extent of the contamination.
- All areas possibly affected will be sampled and analyzed to determine the extent of contamination.
- Once we clearly know the facts, a cleanup plan will be developed, including identifying who is responsible for the cleanup.
- It is probable do not guess or make promises that contaminated land will be returned to its former use. However, areas will not be returned to their former use until we are sure they do not pose a risk to human health.

31. Will people and businesses be compensated for the disruption and money they've lost as a result of the incident?

- All companies in the nuclear industry contribute to a pool of funds under the ..... Act to compensate those impacted by the incident.
  A claims process will be set up soon.
- Notice about when and where to file claims will be made available through the media.
- Like any other insurance, the specific amounts will be determined based on losses incurred.

32. Are NPPs safe?

- NPPs are designed and built to rigorous standards of safety.
- Safety standards are set by the CNCAN.
- Operating licenses are granted only to plants that meet all the safety requirements.
- NPPs are constantly inspected to ensure compliance.
- In addition to general standards, safety systems for plants are designed to meet
  specific site requirements.
- All plants are built with multiple barriers and safety systems to make the probability that radioactive material can escape to the environment as low as reasonably achievable.

33. Should we shut down all our NPPs until we're sure they're safe?

- While [insert: agency or Federal Government] will conduct a thorough investigation to determine what happened, there is no reason to believe this was a systemic problem.
- Shutting down other plants would be unnecessary and a premature response to this particular situation consider re-phrasing so it does not sound like protecting nuclear industry.
- NPPs have a very strong record of safely producing power.

34. Are governments prepared to deal with NPP emergencies?

- Yes. All communities and States where NPPs are located are required to have up-to-date plans and procedures to deal with all possible emergencies. The CNCAN will not (does not?) allow an NPP to maintain its operating license without these plans.
- The responsibility for responding to incidents, both natural and man-made, begins at the local level – with power plant operators, individuals, and public officials in the county, city, or town affected by the incident.
- The Federal Government has many resources and additional trained experts to help when called on.
- Frequent drills and exercises are conducted to assure that the plans – both at the plant and in the surrounding communities – are successful, and that personnel are fully trained and well-

coordinated.

- The NRF lays out in detail the role of the Federal Government in dealing with many kinds of emergencies, generally in support of State, local, and tribal responders.

35. How will this incident affect our relationships with other countries?

- The .... will facilitate communications with foreign media and outreach to foreign governments regarding safety and security of foreign nationals currently in the ..... what if the release affects other countries territory?
- We have a treaty that requires us to notify the International Atomic Energy Agency (IAEA) when these incidents occur. .... has done so [if appropriate].

36. Will this affect air travel?

- Until we have more information, expect air travel in and near the affected area to be restricted.
- This is to keep air crews and passengers safe.
- Possible inspections before departures may need to take place.
- It also keeps the airspace free for response and recovery activities.

37. Will this affect travel on waterways, both at home and abroad?

- Until we have more information, expect the use of navigable waterways in the affected area to be restricted.
- This is to keep mariners, other waterway users, and passengers safe.
- Possible inspections before departures may need to take place.
- It also keeps the waterways free for response and recovery activities.

38. How much radioactive material has been released from the NPP?

- The release is still under way [or the release has been stopped]. We won't have specific information until we do monitoring and analysis, both on the ground and via aerial surveillance.
- But based on what we know of the plant's operations we can state that the plant is likely to have emitted [_____].

39. How do you monitor/detect radiation?

- Specialized instruments are used to detect radiation.
- Specialized emergency responders are trained and skilled in using these instruments.
- Information about the amount and composition of radioactive materials that may have been released comes from several sources:
- The power plant's monitoring equipment.
- Computer models.
- Ground and aerial sampling and analysis.

40. Will radioactive material from an NPP accident spread out over the entire EPZ?

- Probably not.
- A radioactive plume (cloud containing radioactive materials discharged from the NPP during an accident) travels in the same direction as the wind rather than spreading out over the entire EPZ.
- The nature of the plume characteristics is based on natural environmental factors, such as terrain, wind speed, wind direction, temperature of the air released, temperature at ground level and higher elevations, and turbulence due to solar heating.
- As radioactive material is released from the NPP to the surrounding air, it travels downwind and expands both upward and outward.

- The expansion of the plume causes the concentration of the radioactive material in the plume to decrease as it travels away from the source and deposits on the land it crosses. Precipitation also removes radioactive material from the plume, increasing deposition on the ground and decreasing concentration in the plume farther downwind.
- The radiation dose to persons in the plume is a function of the concentration of the radioactivity at any point in the plume. So, as the plume expands downwind, the concentration decreases as does the radiation dose.

41. What areas are contaminated and how will you notify the public?

- State, local, and tribal governments will determine the relative safety of the affected areas and communicate their decision(s) through traditional media outlets.
- Monitoring and sampling are being conducted to confirm the locations of the affected and unaffected areas.
- A monitoring and sampling plan [is being/has been] developed and will be updated as new information comes in.
- It is important to identify areas that have not been contaminated so officials can make the right decisions about what actions to take.
- People will be informed of our findings as the information comes in and is verified.

42. What are the environmental effects of a radioactive material release?

- Responders are collecting environmental samples to get a complete picture of the extent of the environmental impacts.
- State, local, and tribal partners are working together to implement plans for sampling and analysis.
- Right now we are gathering information that has a direct impact on public safety, such as levels of contamination, while taking into account the need to protect our field teams and responders.
- Monitoring will be ongoing for some period of time. We will be continually analyzing all types of samples that will help us understand the environmental impacts. These samples will include but are not limited to precipitation, bodies of water, soil, vegetation, crops, livestock, fish, and milk.
- A representative analysis to determine the extent of the contamination is the appropriate way to understand the environmental impacts from this incident.

43. How do people know if they have been exposed to radiation and to radioactive material?

- The only way to be certain is to get monitored at a monitoring and decontamination center, as identified in the State, local, and tribal emergency plans.
- If you are near the incident, you may have been exposed to radiation and you also may be contaminated by radioactive material.
- Exposure to small amounts of radiation will not produce any immediate health effects.
- A large dose of radiation may cause skin burns, nausea and vomiting.
- If you have these symptoms, seek medical attention immediately.
- Emergency responders will monitor the levels of radiation and State, local, and tribal government officials will use this information to determine areas of concern.

44. How and why are you tracking people who have been exposed to radiation and radioactive material?

- Your local officials will set up community reception centers to check people for contamination with radioactive material and assist them with needed services and enter them into a registry [if indicated] for tracking and follow-up.
- The registry permits follow-up with people who need immediate health care and enables long-

term health monitoring for individuals who have been exposed to radiation.

45. Are we tracking the radioactive material as it moves around the earth?

- We have estimated and are monitoring the actual path of the radioactive material in the atmosphere.
- Right now we are identifying areas of concern for potential harmful radiation exposures and contaminated areas.
- As the radioactive material moves through the atmosphere and radioactive material falls to the ground, the air becomes less hazardous.
- Exposure, Contamination and Decontamination

46. What is radiation?

- Radiation is the release of energy from unstable atoms in the form of particles or waves.
- Everything is made of atoms.
- Some atoms are unstable and release energy to become stable.
- These atoms are radioactive.
- Radiation can be detected using special equipment.
- People cannot see, smell, hear, feel, or taste radiation.
- With the correct instruments, radiation is easily detectable.
- Radiation affects people by depositing energy in body tissue.
- When an incident occurs, scientists can calculate how much radiation energy a person might absorb.
- There is a direct relationship between how much radiation energy a person absorbs (dose), how fast they absorb it (dose rate), and potential health effects.
- Unnecessary radiation exposure should be avoided.

47. What's the difference between alpha, beta, and gamma radiation? How do these types of radiation affect people?

- Alpha radiation (also called alpha particles):
- Alpha particles cannot penetrate most matter. A piece of paper, clothing, or the outer layers of skin is sufficient to stop alpha particles.
- Radioactive material that emits alpha particles (alpha emitters) can give a radiation dose when inhaled, swallowed, or absorbed into the blood stream through wounds.
- Beta radiation (also called beta particles):
- Beta particles can be stopped by a layer of clothing or by a few millimeters of a substance such as aluminum.
- Beta particles are capable of penetrating the skin and causing cutaneous radiation injury, but this is not likely to occur from an NPP incident.
- As with alpha emitters, beta emitters can produce a radiation dose when they are inhaled or swallowed or absorbed into the blood stream through wounds.
- Gamma radiation (or gamma rays):
- Gamma rays are essentially the same as X-rays. They are a type of penetrating
- radiation. Denser and thicker materials stop them better. Several feet of concrete or a few inches of lead are required to stop most of them.
- Gamma rays are a radiation hazard for the entire body.
- While gamma rays can easily pass completely through the human body, some
- fraction of the energy will always be absorbed by body tissue.
- Gamma rays can cause a radiation dose even if the radioactive material does not get into our bodies.

- Neutrons?

48. How much radiation is safe? How much is considered low risk?

- According to radiation safety experts, radiation exposure between 5–10 rem (check for usage of SI units) usually results in little to no harmful health effects.
- Infants and pregnant women are more sensitive to radiation exposure than healthy adults.
- It takes a large dose of radiation—more than 75 rem—in a short amount of time (usually minutes) to cause immediate health effects like acute radiation sickness.
- Differences like age, gender and even previous exposure are factors that might
- influence a body's reaction to radiation exposure.
- You can lower your risk of developing health effects by limiting your exposure to radiation (time, distance, shelter).
- Get inside a building or to a basement to protect yourself.
- Get clean.
- Listen to officials and emergency responders for further safety instructions.

49. Does radiation cause cancer?

- Radiation from natural background and other man-made sources is a minor contributor to our overall cancer risk.
- According to radiation safety experts, radiation exposure between 5–10 rem usually results in little to no harmful health effects.
- The risk of radiation causing cancer increases with the radiation dose.
- During an emergency listen to local officials for instructions.
- Advice given during emergencies is meant to limit unnecessary radiation dose.
- Follow instructions to minimize exposure.

50. Are people at risk for radiation poisoning or sickness?

- Radiation sickness occurs only when a person is exposed to very high levels of radiation
- Pregnant women, infants, and young children are more susceptible to the health effects of radiation exposure.
- The steps for reducing radiation exposure are the same for all populations.

51. What is Acute Radiation Syndrome/Sickness (ARS)?

- ARS is an illness from short-term exposure to a large amount of radiation.
- You cannot get ARS from chronic long-term exposure to small amounts of radiation.
- The radiation must reach internal organs.
- Symptoms appear within minutes or days.
- It is important to know the signs and symptoms.
- Signs of ARS include: injury like a burn or rash, nausea, and/or vomiting.
- The symptoms may subside and come back.
- ARS can lead to death.
- Seek medical attention immediately if you think you are suffering from ARS.

52. Are there any treatments for radiation sickness?

- There are limited treatments available for people with radiation sickness.
- Local emergency workers and medical professionals will monitor (evaluate, check) the situation to determine if medical treatments are needed and what kind of medical treatment to provide.
- Although we expect cases of radiation sickness to be extremely rare, seek medical attention immediately if you have these symptoms: skin burns, nausea, and/or vomiting.

53. Are there specific protective actions for pregnant women?

- Pregnant women should follow any specific guidance for women who are actually or potentially pregnant, as well as the same protective action steps as the rest of the population.
- Pregnant women should inform response and safety officials about their condition so that they can receive proper attention.
- Pregnant women should call or visit their doctor or OB/GYN as soon as possible if they have concerns.

54. Should nursing mothers continue to breastfeed?

- Some radioactive materials can be passed through breast milk. If you are near an incident, you may have been exposed to radioactive material.
- If you think you have been contaminated by radioactive fallout, medical workers may tell you to use formula instead of breast milk. When possible, contact your doctor for further instructions or advice. You may continue to breastfeed if there is no other source of food available.
- Tell emergency workers that you are breastfeeding so they can so they can advise you of any health risks associated with continuing to breastfeed.

55. How is background radiation distinguished from radiation emitted by the power plant?

- Distinguishing between background radiation and radiation from a specific incident may require special instruments.
- In some areas we have historical baseline data on background radiation levels.
- In a situation like an accidental release from an NPP, there will be areas where radiation levels are clearly above background levels.
- Certain substances may be found in releases from a NPP that are not normally found in the environment, and special equipment can be used so it is possible to tell the difference.
- As we gather more information, our radiation scientists will help identify the specific radioactive materials from this incident.

56. What is the difference between radiation exposure and radioactive contamination?

- Exposure occurs when radiation interacts with the body.
- Exposure can be long-term at low levels, such as that from background radiation (the radiation that is in the environment all the time).
- Or exposure can be short-term at a high dose, such as that from a major accident, diagnostic medical imaging or radiation therapy.
- Health effects depend on the strength and length of the exposure.
- You can be exposed to radiation without being contaminated.
- External radioactive contamination (or external contamination) occurs when radioactive material settles on a surface.
- That surface could be your body or clothing, a structure, or an object.
- If a person is externally contaminated with radioactive material, they are being exposed to radiation from radioactive material outside but on the surface of his or her body.
- Internal radioactive contamination (or internal contamination) occurs when radioactive material enters the body.
- If a person is internally contaminated with radioactive material, they are being exposed to radiation from radioactive material inside their body.
- This can occur after radioactive material is swallowed, inhaled, injected, or absorbed through the skin or wounds.

57. How long does an exposed person have to remove external contamination from their body?

- There is no set time. People should remove external contamination as soon as possible to reduce

their radiation dose by using the following simple steps.

- If you think you have been externally contaminated, the best thing to do is take a shower.
- Remove your clothing (being careful not to inhale contamination or get it into your mouth or eyes); put it in a plastic bag and place it outside or in an out-of-the way area.
- Shower using lukewarm water and lots of soap and water. Wash your hair with shampoo or soap and water. Do not use conditioner in your hair because it will bind radioactive material to your hair, keeping it from rinsing out easily.
- Be careful not to scratch the skin.
- If you have water but cannot shower, remove the outer layer of clothing and wash exposed areas.
- This can remove up to 90% of the contamination.
- Place the clothing in a plastic bag; leave it outside or in an out-of-the-way area.
- When dusting off your hair or clothing, stand away from other people and be careful not to breathe in the dust or get it in your mouth or eyes.
- Wash exposed skin using lots of soap and lukewarm water.
- If you do not have access to water, use one of the following:
- It is best to clean off with a moist towelette or baby wipe.
- Otherwise, clean off with dry paper towels.
- Dispose of the towels with the clothing.

58. Can radiation or radioactive material be spread from person to person?

- Radioactive material can be spread in the same way that dust or mud can be tracked into the home or by touching another person or object.
- Radiation from radioactive material or another person or surface can expose you and give you a radiation dose, even if you do not have any of the radioactive material on you.
- Neither radiation nor radioactive material is contagious like some infectious diseases.

59. What is external decontamination? How is it done?

- External decontamination is the removal of particles of radioactive material from people, clothing, pets, or objects, usually by simple washing.
- Decontamination may be necessary after a radiological release.
- Radioactive particles (fallout) can settle on clothes, skin, hair, buildings and objects.
- Decontaminating yourself will significantly reduce your exposure to harmful radioactive particles.
- The longer the particles stay on your skin, the more harm they can do.
- Decontamination may be the only step needed after a radiological emergency.
- Immediate decontamination is recommended if you or your possessions have become contaminated during a radiological emergency.
- Decontamination centers may be set up to help with decontamination and to prevent the spread of contamination.
- Follow the directions of the emergency responders to ensure effective decontamination.
- You should go to a/the reception and care center to be checked.
- If you are found to be contaminated, you will be directed to shower, and then rechecked to be sure you are free of contamination.

60. How should people decontaminate their pets?

- Radioactive materials could contaminate both people and pets.
- Contact with and movement of contaminated animals might expose individuals and items to the contaminant.
- Seek advice from local response authorities.
- If you must decontaminate your pet, the suggested method is to:

- Bathe your pet thoroughly with shampoo and water and rinse completely.
- Wear waterproof gloves, an apron, and, if possible, a dust mask to protect yourself from (further) contamination, including inhaling fallout dust.
- Follow local jurisdictional guidance on the disposal of bath water and items coming into contact with contaminants.
- Shower yourself when finished

61. How should people decontaminate their homes and their possessions?

- You need to get information from emergency responders or local officials on whether you need to decontaminate your home and its contents.
- If you need to decontaminate your home, get guidance from emergency responders or local officials.
- This will likely contain information on wearing protective clothing when cleaning.
- There are likely to be special instructions for cleaning the inside and outside of your home.