## EMERGENCY SCENARIOS IN INDUSTRIAL RADIOGRAPHY

**(Source IAEA document on Radiation Safety in INDUSTRIAL RADIOGRAPHY (SSG-11)**

1) A source becomes stuck in the guide tube or the collimator, or near the entrance to the exposure device.
2) Physical damage is caused that affects the shielding.
3) A source becomes disconnected from its drive cable and remains in the guide tube.
4) A source is projected out of the end of the guide tube.
5) A pipeline crawler becomes stuck in a pipe with the source exposed.
6) A source is lost.
7) There is a fire.
8) Unauthorized persons are present in the controlled area during an exposure.

For x ray generators, the operating organization should consider incidents in which:

1) Generation of radiation fails to terminate after the intended time period.
2) An X ray generator is unintentionally energized.
3) A radiographer fails to terminate a manually controlled generation of radiation.
4) A safety system or warning system malfunctions, including deliberate action to override a system.
5) Another malfunction causes X rays to be generated other than in a controlled manner.
6) Physical damage is caused that affects the shielding or filtration.
7) Unauthorized persons are present in the controlled area during an exposure

To minimize exposures and to allow for a proper response, the action plans should as a minimum do the following:

1) Restrict access to the vicinity of the source — ensure that controlled area barriers are in the correct place for a given situation;
2) Ensure that the radiation protection officer is notified (and a qualified expert as necessary);
3) Remain calm, move to a safe distance plan subsequent actions, rehearse the actions without the source and then implement the plan;
4) Never enter areas of potentially high, but unknown, dose rates unless carrying a functional survey meter and, preferably, wearing a personal alarm monitor and/or direct reading dosimeter
5) Never touch a radioactive source or allow the hands to come close to it;
6) Do not exceed authority or personal expertise;
7) Seek assistance from a qualified expert or from the source supplier if necessary

The radiation Safety officer should:

1) Plan a specific course of action on the basis of previously established emergency procedures, taking care to minimize doses that may be received as a result of this course of action.
2) Move to an area away from the controlled area and rehearse the planned course of action before entering the controlled area to implement the emergency plan.
3) Implement the planned course of action to the extent that training, equipment and authorizations allow; under no circumstances allow the source to come into contact with the hands or other parts of the body.
4) If the course of action taken is unsuccessful, leave the controlled area and consider the next course of action while maintaining surveillance of the controlled area.
5) Call for technical assistance, if necessary, from a qualified expert or from the manufacturer.
6) When the emergency is over and the source has been made safe, assess the doses received and prepare a report.
7) Return personal dosimeters to the dosimetry service for the purpose of accurate assessment of exposures.
8) Send damaged or malfunctioning equipment to the manufacturer or to a qualified expert for detailed examination and repair prior to any reuse.
9) (Prepare an accident report and notify the regulatory body as required.

For X-ray Generators:

1) Recognize that an abnormal situation has arisen that might constitute an emergency.
2) Turn off the electrical power to the radiography equipment.
3) Perform a radiation survey to confirm that the tube is de-energized.
4) Do not move the radiography equipment until details such as position, beam direction and exposure settings (tube voltage, current and time) have been recorded.
5) Inform the radiation Safety officer of what has happened.
6) Do not use the X ray generator until it has been examined and repaired by the manufacturer or by a qualified expert.

The Radiation Safety Officer should:

1) Assess the possible doses that could have been received and prepare report.
2) Return personal dosimeters to the dosimetry service for the purpose of accurate assessment of exposures.
3) Prepare an accident report and notify the regulatory body as required