



DOW CHEMICAL U.S.A.

MIDLAND DIVISION
MIDLAND, MICHIGAN 48640

EMERGENCY PROCEDURE FOR RADIOGRAPHERS

I. General Considerations

A. Definition of Emergency

Three types of emergency situations may arise.

1. Plant emergencies which threaten the safety of radiographers, or the source, occur when the Plant Alert or Plant Evacuation signals sound, or when fire, explosion or other danger is obvious to the radiographers whether or not the plant signals have sounded.
2. Source emergencies occur when the source mechanism jams or malfunctions, or when loss or rupture of the source is known or suspected, or when a vehicle accident occurs during transportation of the source.
3. Personnel exposure emergencies occur when a radiographer or other person is known or suspected to have been exposed in excess of normal operating exposure or normal restricted area perimeter limits. In addition, radiographers are considered to be overexposed whenever a pocket dosimeter, during use of the source, discharges beyond the scale for any reason.

B. General Procedures in an Emergency

1. First aid and medical attention for injured persons takes precedence over radiation safety procedures, because risk of overexposure to the radiographic source is less than the potential risk to the injured persons if attention to their needs is delayed.
2. Notification of Plant Protection, supervision and Industrial Hygiene personnel should be done as soon as is practical, after the emergency occurs. Plant Protection Dispatcher, 517 636-4400 will send scouts to assist and notify other persons, if asked to do so. Be certain that the Dispatcher understands that he is to call others.

<u>Radiographer Supervision</u>	<u>Telephone Numbers</u>	
	<u>Plant</u>	<u>Home</u>
H. A. Field	6-0101	
H. T. Bailey	6-1736	
<u>Industrial Hygiene</u>		
L. G. Silverstein	6-4676	
K. R. Hoyle	6-1377	

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3. If emergency occurs in transit or outside of a Dow plant, local police should be notified and their assistance requested. Dow Dispatcher in Midland should be notified and asked to contact persons in I.B.2, above. Dispatcher should be given telephone number or other means of contacting radiographer involved.
4. Radiographer should advise Dow Plant Protection or local police if there is a need to restrict access to the area, and should assist them in setting up barricades and patrolling area to prevent entrance of unauthorized persons. Unless injured, radiographer should remain at scene of emergency until supervision and Industrial Hygiene personnel arrive to correct the situation.

II. Specific Procedures

A. Plant Emergencies

1. Alert Signal Sounds

- a. Reel in source, lock container, check with survey meter.
- b. Proceed to check point and determine what emergency exists.
- c. If time and lack of risk permits, return source to vehicle, remove signs and ropes, drive out of emergency area.
- d. If Step c is not advisable, notify Plant Protection of the exact location of the source, whether it is shielded, and whether the ropes and signs are still up.

2. Evacuation Signal Sounds

- a. Proceed immediately to check point and determine what emergency exists.
- b. Only if there is no risk to you, secure source and remove it to safety.
- c. Notify persons in I.B. ., above.
- d. Advise Plant Protection of exact location of the source, whether it is shielded or unshielded, and whether ropes and signs are still in place.

- e. Stand by with survey meter to find the source when emergency permits re-entry into the area, or to assist the Health Physicist when he arrives.

B. Accidents Involving the Cobalt Source

1. Jammed Mechanism

- a. Do not leave unshielded source unattended. Keep people away from roped off area.
- b. Notify supervision, Industrial Hygiene and Plant Protection. If you are alone and must leave to telephone, try to shield the source with a lead sheet. Locate it in the cable by using the survey meter.
- c. After notifying people, return to source and stay with it, at a safe distance, until help arrives. Assign Plant Protection to help guard the area, advising them where it is safe for them to stay.
- d. Stand by to assist and to report the incident in detail to the Health Physicist.

2. Lost Source

- a. Use survey meter to locate general area of the source.
- b. Rope off area and prevent entry to it of all persons except supervision or Health Physicists.
- c. Notify persons in I.B.2., above.
- d. Locate the source using the survey meter and replace it in its container, only if this can be done with less than 500 mrem exposure to you.
- e. If Step d is not advisable, stand by to assist Health Physicist and to report the incident to him in detail.

3. Rupture of Source or Contaminated Area

- a. If either is even suspected, return source to its container.

- b. Do not attempt to clean up contamination until supervision and Health Physicist arrive at scene.
- c. If source cannot be replaced in its shielding, rope off radiation area and restrict entry to supervision and Health Physicist.
- d. Notify persons in I.B.2., above.
- e. Stand by to assist Health Physicist and to report incident in detail to him.

4. Vehicle Accident During Transport

- a. Attend to injured persons first.
- b. Make visual inspection of source container to ascertain its condition. Use survey meter to confirm that source is shielded.
- c. If visual inspection or survey meter indicates an unshielded source, proceed as in II.B., Lost Source, Steps a - e.
- d. To prevent traffic tie-up, accept more than 500 mrem exposure, if necessary, to find source and replace it in its container. As described in I.B., it is very unlikely that quarterly exposure limits will be exceeded.
- e. If source is intact and shielded, proceed as in a nonradiation vehicle accident.
- f. Report accident promptly to persons in I.B.2., above.

C. Exposure of Radiographers or Others

1. Radiographers

- a. If you suspect an overexposure, or if dosimeter discharges beyond the scale for any reason, the other radiographer should secure the source in its container and both should proceed to the Medical Department, 607 Building.
- b. Notify persons in I.B.2., above. If source is left in the plant, ask the Dispatcher to send a scout to stay with the source until it is reclaimed.
- c. Describe incident to the doctor in as much detail as possible.

- d. Remember that fatal or even acutely hazardous exposures are not at all likely.
- e. Deliver film badge and dosimeters to the Health Physicist.

2. Others

- a. If exposure to other persons is even suspected, secure the source and accompany the affected persons to the Medical Department.
- b. Reassure persons that the overexposure is, at most, a technical one, and not great enough to cause injury, but that Dow, Michigan and AEC regulations required the action.
- c. Notify persons in I.B.2., above.
- d. Relate incident to the doctor and the Health Physicist.

III. Notification of Michigan Department of Health and AEC

If any person could have received an exposure greater than permitted by State and AEC regulations, the incident must be reported to both agencies.

The decision on the need to report, and the report itself will be made only by members of the Radiation Safety Committee or the Health Physicist.

IV. Post Emergency Procedures

A. The Source

- 1. After the source is reclaimed, a complete survey of radiation levels from the source in its container will be made by the Health Physicist.
- 2. A wipe test of the source, its container and handling equipment will be made by the Health Physicist. The source will not be used until the radiation survey and wipe tests are completed and the report made to radiographic supervision.
- 3. Immediate action will be taken to repair the source or its container, if it is found necessary.
 - a. The source will be sealed and returned to the supplier or else sealed and stored for disposal to an outside firm.
 - b. If the container needs repair, the source will be removed and placed in the cave at 1602 Building for storage.

After cleaning and wipe tests, the container may be released to the Shops for repairs.

B. The Area

1. A thorough survey of the area involved will be made by the Health Physicist with the assistance of the radiographers.
2. Any decontamination necessary will be done under the direct supervision of the Health Physicist, by the radiographers. Appropriate protective clothing, procedures and monitoring will be designated by the Health Physicist.
3. Radioactive wastes will be stored for later disposal under the supervision of the Health Physicist.
4. The area will be thoroughly surveyed after clean-up.

C. The People

1. All personnel, and their equipment, will be kept at the scene until they can be monitored for contamination by the Health Physicist.
2. Those who require decontamination will be taken to Medical for showers and further monitoring.
3. All contaminated clothing and equipment will be segregated at the scene.
4. All film badges and dosimeters will be turned in to the Health Physicist. Radiographers or Plant Protection scouts who used survey meters will also report in detail to the Health Physicist.
5. Anyone who is injured, however slightly, will report to the Medical Department.

L. G. Silverstein
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H. R. Field
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