

Attachment II



**DOW INDUSTRIAL SERVICE**

DIVISION OF THE DOW CHEMICAL COMPANY

ABBOTT ROAD BUILDINGS  
MIDLAND, MICHIGAN 48641

RADIATION

SAFETY

MANUAL

8508010595 850611  
PDR FOIA  
KOHNB5-256 PDR

## TABLE OF CONTENTS

<u>SECTION</u>	<u>Page</u>
1. PURPOSE OF MANUAL	1
2. SCOPE OF MANUAL	2
3. DEFINITIONS	3
4. RESPONSIBILITIES	6
4.1 Safety Committee	6
4.2 Radiation Safety Officer	8
4.3 Alternate Radiation Safety Officer	10
4.4 Individual Employees	10
5. PERSONNEL PROTECTION PROGRAM	12
6. MAXIMUM PERMISSIBLE EXPOSURE	13
7. GENERAL PROCEDURES FOR RESTRICTED AREAS	14
8. RADIOLOGICAL SURVEYS	15
9. WASTE DISPOSAL	19
10. EMERGENCY PROCEDURES	20
11. EMERGENCY FIRST AID	21
12. SPECIAL EMERGENCY PROCEDURES	22
13. DECONTAMINATION SERVICES	23

1. PURPOSE

- 1.1 To prescribe the Dow Industrial Service (hereafter referred to as D.I.S.) policy and program for the protection of health and safety from ionizing radiation, as stipulated in A.E.C. License No. 21-00265-07 granted to D.I.S. to conduct decontamination services.

20460

## 2. SCOPE OF MANUAL

- 2.1 This policy and program encompasses the DIS rules and procedures concerning the use of and protection from sources of ionizing radiation. The contents apply to all DIS employess.
- 2.2 No employee shall deviate from any procedure established by this memorandum except as authorized in accordance with section 2.3.
- 2.3 Any exceptions or deviation from the rules and procedures set forth in this manual will be submitted in writing for approval of the Radiation Safety Committee. No exception or other change will be approved which is not within the scope of the authority granted under the applicable AEC licenses or amendments thereto.
- 2.4 All technical and supervisory personnel with responsibility for, and all regular employees who work with, radiation hazards are responsible for thorough knowledge of the provisions of this manual and of the provisions of AEC 10 CFR Part 20, "Standards for Protection Against Radiation." A copy of Part 20 is attached as Appendix A.

20488

### 3. DEFINITIONS: MEASUREMENTS AND AREAS

#### 3.1 Definition: Measurements

##### 3.11 Maximum Permissible Concentration in Air (MPC)

The maximum permissible concentration for radioactive material in air is defined as that concentration which can be breathed by workmen during forth hours of work per week for an indefinite period of time with expectation of no harmful results. No exposure to concentrations of radioactive material shall be deemed to be "permissible" within this definition unless such exposure is permissible under applicable regulations of the Atomic Energy Commission or other regulatory agency.

##### 3.12 Maximum Permissible Exposure (MPE). The maximum permissible exposure is that amount of radiation which may be received by an individual within a specific period with expectation of no harmful results to himself. No exposure to radiation shall be deemed "permissible" within this definition unless such exposure is permissible under applicable regulations of the Atomic Energy Commission or other regulatory agency.

##### 3.13 Roentgen Equivalent Man (rem). The rem is the quantity of any radiation such that the energy imparted to a biological system (cell, tissue, organ or organism) per gram of living matter by the ionizing particles present in the region of interest has the same biological effectiveness as an absorbed dose of one rad from lightly filtered x-rays generated at potentials of 200 to 300 kilovolts. Dose records are usually given in

millirem (mrem) units. A dose in rems is equal to the dose in rads multiplied by the appropriate relative biological effectiveness (RBE).

- 3.14 Relative Biological Effectiveness (RBE). The relative biological effectiveness is defined as the inverse ratio of the dose of two different radiations necessary to produce the same biological effect. (Ref. Appendix B.)

3.2 Definition: Areas

- 3.21 Unrestricted Area means an area where entry is not controlled for purposes of radiation protection.
- 3.22 Restricted Area refers to an area access to which is controlled for purposes of radiation protection.
- 3.23 Radiation Area means any area, accessible to personnel, in which there exists radiation at such levels that a major portion of the body could receive in any hour a dose in excess of 5 mrem, or in any five consecutive days a dose in excess of 100 mrem.
- 3.24 High Radiation Area means any area, accessible to personnel, in which there exists radiation at such levels that a major portion of the body could receive in any one hour a dose in excess of 100 mrem.
- 3.25 Airborne Radioactivity Area means:
- (a) Any room, enclosure, or operating area in which airborne radioactive materials exist in concentrations in excess of the amounts specified in 10 CFR 20, Appendix B, Table I, Column 1; or
  - (b) Any room, enclosure, or operating area in which airborne radioactive materials exist in concentrations which, averaged over the number of hours in any week during which individuals are in the area, exceed 25 percent of the amounts specified in 10 CFR 20, Appendix B, Table I, Column 1.

3.3 Definition: General

- 3.31 Regulatory Authority. With regard to any activity by DIS or its employees involving the receipt, possession, use or transfer of radioactive material, the term "regulatory authority" shall be deemed to mean the Atomic Energy Commission or the regulatory agency of an agreement state or other government agency having legal licensing or regulatory jurisdiction.
- 3.32 Radioactive Material. Except where the context otherwise requires, the term "radioactive material" as used in this manual shall be deemed to include source, by-product, and special nuclear material.
- 3.33 Commission means the U. S. Atomic Energy Commission.

#### 4. RESPONSIBILITIES

- 4.1 The Radiation Safety Committee (hereafter referred to as the Safety Committee) is responsible for the general supervision and coordination of all programs involving the receipt, possession, use or transfer of radioactive material or involving exposure of DIS personnel to radiation or radioactive material; and for assuring that appropriate procedures are established and observed for protection from hazards from ionizing radiation.
- 4.11 The Safety Committee will review and act upon detailed written procedures governing DIS personnel engaged in the procurement, possession, use and transfer of radioactive material.
- 4.12 All action of the Safety Committee must be by unanimous vote.
- 4.13 The Safety Committee will coordinate the examination of all supervisory personnel to determine their degree of understanding and knowledge of the radiation protection program and the specific job operations and requirements that involve the use of radioactive materials. No supervisory personnel will be authorized to work with radioactive materials unless approved by the Committee. The Safety Committee will have the responsibility of assuring that supervisory personnel are thoroughly familiar with the steps involved in all projects assigned to them, the extent of radiation hazards involved, and the precautions necessary for protection of personnel and the public.
- 4.14 The Safety Committee will be responsible for the implementation of the training program and the selection of instructors, described in Appendix D. The Committee will have the right to alter course

material to meet the individual backgrounds of new personnel. The Committee will take into consideration the following individual characteristics:

- (a) Education and training
  - where trained
  - nature and scope of training program
  - formal and on-the-job training
- (b) Experience with radiation
  - where gained
  - duration
  - type of experience
  - particular isotopes
  - radiation levels
- (c) Duties to be performed

4.15 The Safety Committee will have a secretary whose functions will include:

- (a) Preparation of the agenda for meetings of the Safety Committee
- (b) Scheduling of meetings
- (c) Maintaining minutes and other records of the Committee
- (d) Carrying out such additional functions as may be prescribed by this manual or by the Committee.

4.16 The members of the Safety Committee are:

- 1 - Harold R. Hoyle, Chairman
- 2 - Lawrence G. Silverstein, Secretary
- 3 - Joel B. Charm, Radiation Safety Officer
- 4 - Dale Ducommun, M.D.
- 5 - Oswald U. Anders
- 6 - Chester E. Otis
- 7 - Al C. Wilcox

4.17 The Safety Committee will meet at least semi-annually and will review each decontamination job. A quorum will consist of not less than four members present.

- 4.2 The Radiation Safety Officer. He is responsible for the collection of all information required by the Committee to conduct its business, including AEC Forms 4 and 5 survey and waste disposal records, and accountability records for radioactive material. He is the individual assigned to each job-site activity who is responsible for supervision of procedures and requirements for protection of health and safety from hazards of ionizing radiation as established by the Safety Committee.
- 4.21 The Radiation Safety Officer shall advise and consult with employees to assist them in carrying out the radiological safety program described herein for all activities involving sources of ionizing radiation.
- 4.22 The Radiation Safety Officer is responsible for maintaining the records and reports required under this manual and by the regulations of the regulatory authority.
- 4.23 The Radiation Safety Officer is responsible for the calibration and maintenance of radiation survey equipment.
- 4.24 The Radiation Safety Officer is authorized to direct suspension of project work when such action is in his judgment, necessary in order to protect the health and safety of employees or public, or to protect property against damages. Any such action shall immediately be reported to the Supervisor of the project, and to the licensee or AEC contractor at whose facility the work was being carried out.
- 4.25 The Radiation Safety Officer will:
- (a) Discuss and coordinate with appropriate customer personnel the procedures to be used during the operation to assure radiological safety. He will take such steps as are necessary to assure that personnel understand operating procedures which have been approved for the project.

- (b) Instruct and train his personnel in the requirements for working with radioactive materials and seeing that they comply with applicable rules and regulations governing radiation safety, and with written operating procedures which have been approved for the project.
- (c) Assure that adequate personnel and area surveys and monitoring are conducted for all activities involving radiation hazards; that restricted areas under DIS control are posted and controlled in accordance with requirements of the regulatory authority; and that personnel (both DIS and site personnel) exposures to radiation do not exceed limits specified by appropriate regulatory authority.
- (d) Assure that written procedures are in effect for carrying out the work and are observed.
- (e) Assure that required monitoring devices, protective clothing and equipment, and contamination control methods, are used.
- (f) Assure that all equipment and facilities are operated in accordance with established procedures so as to minimize contamination of equipment.
- (g) Assure that AEC Form 3 is posted in areas assessable to all personnel and that similar posters required by other regulatory authority are properly displayed.
- (h) Have a copy of AEC Radiation Form 5 for all personnel employed under his supervision whose duties include exposure to radiation. He shall maintain appropriate records, including AEC Form 5 for all such personnel. On completion of the project, the Radiation Protection Officer will prepare a report with regard to the project. The records of personnel exposures will be part of such reports.

- (i) Discuss with the Radiological Safety Committee, non-routine operations where radiation exposure or contamination may become involved.

4.3 The Alternate Radiation Safety Officer is the individual approved by the Safety Committee and the Radiation Safety Officer who functions as an extension of the Radiation Safety Officer at the job-site on the swing shift of any around-the-clock job. His responsibilities include any of those of the Radiation Safety Officer delegated to him by that officer. They include in addition:

- (a) Consult promptly with the Radiation Safety Officer with regard to any situation not contemplated by or outside the scope of the written procedures approved for the project.
- (b) Notifying the Radiation Safety Officer, as soon as possible after the area has been secured, in the event of spillage or other accidental release of radioactive material, or any situation in which unusual radiation exposure or contamination is suspected or discovered.
- (c) Reporting promptly to the Radiation Safety Officer violation of the requirements of this manual or of the regulations of the appropriate regulatory authority or any failure to follow prescribed procedures by any individual in his area.

4.4 Responsibilities of Individuals

4.41 The individual worker is responsible for:

- (a) Keeping his daily exposures to radiation as low as practicable.
- (b) Wearing prescribed monitoring devices.
- (c) Wearing prescribed protective clothing whenever contamination is possible, and removing such clothing before entering "clean" areas.
- (d) Using gloves when prescribed.

- (e) Using prescribed techniques and facilities in operations involving radioactive materials in accordance with the established operating procedures.
- (f) Complying with restrictions on drinking, eating and smoking.
- (g) Reporting wounds and lesions and ingestion accidents involving radioactive materials promptly to the Radiation Protection Officer.
- (h) Limiting the volume of active wastes or loss of radioactive materials.
- (i) Cleaning up contamination for which he is responsible, following prescribed procedures.
- (j) Complying with the Radiological Safety Policy and Program, and with any posted AEC, or other applicable regulations.
- (k) At no time will anti-contamination clothing or equipment be worn or carried outside of the work area except for disposal as radioactive waste or for decontamination. Suitable precautions will be taken to protect against the spread of contamination.

## 5. PERSONNEL PROTECTION PROGRAM

### 5.1 Health Physics Roster

- 5.11 Personnel whose work assignments involve possible exposures to ionizing radiation will be carried on the health physics roster.
- 5.12 The Radiation Safety Officer will prepare and maintain exposure records to comply with AEC and DIS requirements.

### 5.2 Medical Procedures

- 5.21 Pre-employment medical examinations will be conducted by a physician for all personnel on the health physics roster. Subsequently bioassays and other procedures will be conducted periodically by the physician where in his judgment such procedures are indicated.
- 5.22 Special medical examinations will be given in the case of possible or known overexposure to radiation, or overexposure, ingestion or inhalation of radioactive material.
- 5.23 In the event that a possible overexposure has been received, the Radiation Protection Officer will arrange for examination by a physician.

### 5.3 Personnel Dosimetry

- 5.31 All personnel carried on the health physics roster will be issued film badges and other dosimeters, and they will be worn whenever Radiation Safety Officer prescribes.
- 5.32 Film badges will be changed on a job basis. If deemed necessary by the Radiation Safety Officer, film will be changed at more frequent intervals. The Radiation Protection Officer will issue and collect film badges.
- 5.33 Personnel on the health physics roster who receive industrial radiation or unusual medical exposure under any circumstances that the exposure is not recorded on their film badge (e.g., diagnostic or therapeutic medical x-ray) are responsible for notifying their supervisor and the Radiation Safety Officer.

6. MAXIMUM PERMISSIBLE EXPOSURE (MPE)

- 6.1 Maximum permissible exposure to external radiation expressed in rems per calendar quarter is as follows:
  - 6.11 Whole body; head and trunk; active blood-forming organs; lenses of eyes; or gonads --  $1\frac{1}{4}$  rems per quarter.
  - 6.12 Hands and forearms; feet and ankles --  $18\frac{3}{4}$  rems per quarter.
  - 6.13 Skin of whole body --  $7\frac{1}{2}$  rems per quarter.
- 6.2 Under certain conditions the values expressed in paragraph 6.1 may be exceeded. (Ref. 10 CFR 20, Section 20.101) In the event that it is essential to exceed the values in 6.1, the prior approval of the Radiation Safety Officer must be obtained.
- 6.3 Self-contained breathing equipment will be on hand at all job sites for use in emergency situations. Prior to job commencement, training will be given to all personnel by the Radiation Safety Officer in the proper use and fitting of this equipment.

7. GENERAL PROCEDURES FOR RESTRICTED AREAS

- 7.1 The following rules shall be meticulously observed in all radiation and restricted areas, and supervisors and Radiation Safety Officers are responsible for insuring strict compliance with these rules:
- 7.11 Smoking, drinking and eating are prohibited in airborne radiation areas and in contamination areas.
  - 7.12 Location of radioactive material will be clearly indicated.
  - 7.13 Properly labeled and suitable containers will be available for waste.
  - 7.14 Protective clothing and monitoring devices will be worn when required.
  - 7.15 No person shall work with radioactive material with open or uncovered wounds in the skin of the hand. Appropriate gloves, bandages or coverings are allowed if approved by the Radiation Safety Officer.

## 8. RADIOLOGICAL SURVEYS

### 8.1 Routine Surveys - Projects

- 8.11 The Radiation Safety Officer will ensure that operational procedures for each project will include such surveys for direct radiation, airborne concentrations of radioactive material, and surface contamination as may be necessary to protect the personnel and, upon completion of work, to leave areas in a safe condition.
- 8.12 Prior to commencing work, the Radiation Safety Officer will conduct such surveys in the work area as necessary for Safety.
- 8.13 Any area where the radiation level exceeds 2.5 mrem per hour will be roped off with yellow and magenta barrier rope and a control established adjacent to the area. A radiation warning tag will be affixed to the rope stating the time of survey, the radiation levels and precautions, and precautions which will be observed when entering and leaving the roped-off area. All areas will also be posted in accordance with requirements of the Commission or other regulatory authority.
- 8.14 Where the project is being carried out in the facility of a licensee of the Atomic Energy Commission or other regulatory authority, the Radiation Safety Officer will request information as to radiological hazards in the work area, including radiation levels, airborne concentrations of radiological material, and surface contamination. The Radiation Safety Officer will also request such other licensee to furnish him with copies of instructions and other requirements of such other licensee applicable to personnel in the area. The Radiation Safety Officer will advise such other licensee of the results of all DIS surveys and will take appropriate steps to assure coordination of radiation protection procedures of both organizations.

- 8.15 A smear or wipe sample will be the means used to survey for removable contamination as distinguished from fixed radioactive material. The Radiation Safety Officer will record and report the results.
- 8.16 After the initial surveys prior to commencement of work, additional surveys for radiation, airborne concentrations of material, and removable surface contamination will be conducted as frequently as the nature of the activities indicates to be desirable. Surveys will be conducted promptly after commencement of operations to determine exposures of personnel to assure that personnel exposures are kept to the lowest practicable level within limits established by the Atomic Energy Commission or other appropriate regulatory authority. Re-surveys will be conducted with sufficient frequency so as to assure that supervisors and Radiation Protection Officers will always have current, reliable information as to the nature and extent of radiation hazards.
- 8.17 The Radiation Safety Officer will, upon completion of an operation, conduct appropriate surveys for radiation, airborne concentrations of radioactive material, and contamination in and about all work areas in which DIS personnel have been engaged.
- 8.18 A record will be made of all surveys. Copies of survey records will be available promptly to the licensee in whose installation the work is being carried out. This includes in all cases records of initial surveys prior to commencement of work, records of surveys after completion of an operation, records of initial surveys after commencement of operations, and other significant surveys. Records of re-surveys during the conduct of operations need not be furnished to the licensee unless significant changes since prior surveys are recorded.

- 8.19 Contaminated materials, handling tools and so forth will be identified with an appropriate radiation sign or symbol.
- 8.20 Contaminated areas will be secured against entry of unauthorized personnel or personnel who have not been advised as to the radiation hazards in the area and protective procedures to be observed. If, in the judgment of the Radiation Safety Officer, such an area cannot otherwise be secured during normal working hours or after normal working hours, the Radiation Safety Officer will station an individual at entrances to the area to control access.
- 8.21 Records of all routine surveys will include the location where measurements are made (or where smears are taken), the time, purpose and location of the survey, as well as any recommendations. The Radiation Safety Officer, on routine surveys, will check the radiation signs, tags and barriers, and will remove them as soon as the radiation conditions no longer warrant their continued use. The Radiation Safety Officer will modify the radiation signs, tags and barriers as changes in radiation conditions so warrant.

### 8.3 Special Surveys

- 8.31 In operations involving possible air contamination the Radiation Safety Officer will conduct air samplings to determine the amount of airborne radioactivity present as frequently as the nature of the operation dictates.
- 8.32 A special survey will be conducted when a radioactive "spill" occurs. If such an event occurs, the Radiation Safety Officer will secure the area to prevent unnecessary exposure and spread of contamination. The Radiation Safety Officer will arrange for decontamination of the area and will conduct a survey thereafter to assure that the area is safe for resumption of work.

8.4 Calibration of Instruments

8.41 All radiological survey instruments will be calibrated and the results of calibration recorded:

- (a) Before each job;
- (b) After any repair.

It is the responsibility of the possessor of such device to inform the Radiation Safety Officer if there is any indication of malfunction.

8.42 All radiological survey instruments will bear a tag on which shall be recorded the date on which the instrument was last calibrated and the initials of the individual who performed the calibration. Radiation Safety Officers are responsible for assuring that survey instruments have been calibrated as required by this manual.

8.43 The Radiation Protection Officer is responsible for calibrating and maintaining records of calibration of radiological survey instruments and for the proper tagging of such instruments.

9. WASTE DISPOSAL

9.1 General

9.11 Radioactive material shall not be disposed of except:

- (a) By transfer to a recipient authorized to receive such waste under regulations of the Atomic Energy Commission or other applicable regulatory authority.

## 10. EMERGENCY PROCEDURES

- 10.1 It is undesirable to specify mandatory detailed procedures in advance for all kinds of possible emergency situations. Consequently the instructions in this chapter should be considered as identifying principal elements to be taken into account by supervisors in coping with possible emergency situations, but they are no substitute for the exercise of sound judgment in a specific situation. In the case of some accident situations, it might become necessary for supervisors to take immediate action to save life or to prevent destruction of property. In the case of other accident situations, it may be that there is no need for immediate corrective action, and in these latter types of situations the supervisor's first responsibility is to consult with DIS headquarters and with appropriate authorities of the facility in which the accident or other emergency has occurred.
- 10.2 All supervisors and employees should be familiar with the provisions of these procedures. Each supervisor, before commencing work in the facility of another organization, should review with the appropriate officials of that organization the emergency procedures established by the latter to deal with accident situations, including alarm signals and similar warning procedures. All DIS personnel should be familiarized with these procedures and alarms.

## 11. EMERGENCY FIRST AID

- 11.1 The supervisor should be aware that prompt action may well make the difference between a minor and a major accident. In consulting with the officials of the facility in which work is being carried out with regard to that organization's emergency procedures, the supervisor should know where to find an appropriate physician to treat employees in case of injuries involving radioactive material.
- 11.2 All supervisors should ensure that each employee is familiar with emergency procedures, the method of reporting an emergency, and his course of action of each type of foreseeable emergency that he may discover in his area. In an emergency situation where medical aid is not immediately available, contact should be made with the nearest AEC Operations Office for assistance in obtaining medical help.
- 11.3 Procedures for Handling Injuries Involving Radioactive Material
  - 11.31 In case of severe injuries, medical and emergency first aid take precedence over contamination control. The Radiation Safety Officer and a physician will be notified immediately.
  - 11.32 The Radiation Safety Officer will assist the physician in surveying the wound, if necessary, and estimate the extent of radioactive contamination in the wound. Objects causing open wounds and all swabs and sponges used in treatment will be saved for evaluation at a later time so that an estimate of the kind and amount of contamination, if any, may be made.
    - (a) If an individual has been hurt traumatically, medical assistance must be obtained promptly and an examination conducted. The appropriate workmen's compensation forms should be completed by the supervisor as soon as feasible. Treatment and prevention of injuries shall take priority over all other emergency procedures.
    - (b) Notify and coordinate emergency procedures with the licensee operating the facility at which the accident has occurred.

## 12. SPECIAL EMERGENCY PROCEDURES

12.1 In the event of any unusual or emergency situations occurring at any job site, the following steps must be taken when applicable:

- (a) The area around the scene of the accident must be secured to prevent access to all but proper authorities.
- (b) Get assistance from local authorities (e.g., police, fire, or AEC Personnel. (See Appendix F)
- (c) Scene must not be left unattended at any time until properly secured.
- (d) Notify, or have local authorities notify, one of the following in the listed order:
  - 1. DIS Executive Office - Midland, Michigan  
517-636-3989
  - 2. J. B. Charm - Midland, Michigan  
517-636-0641  
~~XXXXXXXXXXXX~~
  - 3. L. G. Silverstein - Midland, Michigan  
517-636-4676  
~~XXXXXXXXXXXX~~
  - 4. E. W. Hudgens - Midland, Michigan  
517-636-2869  
~~XXXXXXXXXXXX~~
- (e) Do not discuss the emergency with anyone other than the properly constituted authorities. Any conversation with the press will be by DIS head office management only.
- (f) Submit a complete written report within twenty-four (24) hours to DIS head office.

### 13. DECONTAMINATION SERVICES

- 13.1 Purpose. The purpose of this part of the DIS manual is to establish and describe the requirements and procedures which will be observed in the performance of decontamination services in order to protect against radiation hazards arising out of performance of work and also to protect against the spread of radioactive material. The decontamination services covered by this part of the DIS manual include decontamination of areas and equipment for customers of DIS, as a service to the customer. This part does not establish or purport to establish the levels to which areas or equipment should be decontaminated. The specification of levels which should be achieved by decontamination services is a function of the contracts or agreements between DIS and its customers.
- 13.2 The various steps to be observed in the performance of decontamination service are set forth in the order in which they are generally, but not invariably, performed.
- 13.3 Each decontamination service will be performed pursuant to procedures which have been approved by the DIS Safety Committee and which include the steps listed below as a minimum.
- 13.4 It is the purpose of this manual that the written procedures must be specifically approved individually for each decontamination service by the Safety Committee.
- 13.5 The written procedures under which decontamination services will be performed will include details as to each of the following steps:
- (a) Identification of the customer, the place, and the approximate date the service is to begin;
  - (b) A summary description of the job to be performed;
  - (c) A summary of the process by which the decontamination is to be accomplished;

- (d) Coordination with the customer;
- (e) Obtaining information from customer as to nature and existence of radioactive material and radiation hazards;
- (f) Conduct and recording of surveys and correlation of resulting information with information furnished by the customer.
- (g) Area Posting. Under this heading should be included the description of area caution signs and posters which satisfy, as a minimum, the posting requirements of the Atomic Energy Commission or applicable regulatory authority. There should also be included those steps, such as barricades, roping and so forth, which will be observed, including guards, to control access to and egress from the area in question. The procedures should include provision for identification of barricades, posters, and so forth, on the same map as the survey results are recorded. In establishing these requirements, due regard should be paid to the need for protection of personnel from unnecessary or unauthorized exposure to radioactive material and radiation and also to the need for avoiding the spread of radioactive material to other areas.
- (h) Dosimetry. Under this heading should be identified the procedures which will be observed for identifying and recording individual exposures to radiation, such as dosimeters, film badges, etc.
- (i) Instrumentation. Under this heading should be identified those instruments which will be at the scene of work for use in measuring radiation or determining the presence of radioactive material.

- (j) Equipment. Under this heading should be described at least two categories of equipment which will be utilized in performing the decontamination work. Under the first category should be included the equipment (including materials) which will be directly used in decontamination. In the second category should be listed the kinds of equipment which will be used (other than dosimetry and instrumentation equipment) to protect against radiation hazards, such as survey meters, equipment for taking samples of airborne particulates, equipment for taking smear samples, protective clothing, self-contained air supplies, ventilating equipment, etc. Included also are the various materials which would be used in the prevention of spread of contamination such as plastic floor coverings, etc.
- (k) Personnel. Under this heading should be identified the DIS supervisor and radiation safety officer who are assigned to the operation. Thus the description of supervisory and non-supervisory personnel should include personnel whose functions will consist in whole or in part of radiation protection services. The requisite technical qualifications (including education, training and work experience) important to radiation safety should be described for each function or category of employee.
- (l) Specific Training. The written procedures under this category should include training which should be given to employees in connection with the specific work to be performed including study of the procedures for the work and any dry runs which are prescribed.
- (m) Coordination with Customer. This category should include a description of the manner in which the performance of the services will be coordinated with the licensee for whom the work is to be done. Such

coordination should include necessary discussions with the customer as to the nature and extent of radiation hazards before undertaking the work, comparison of results of surveys before, during and after completion of the work, coordination of activities to assure that there will be no interference between DIS activities and customer activities such as might cause radiation hazards, instruction of DIS employees in the emergency and other procedures of the customer, and so forth.

- (n) Decontamination Process. In this paragraph there should be described a detailed statement of the decontamination steps to be performed. Generally this will commence with identification of the specific areas and equipment, or reference thereto. It should include the various steps to remove contaminants, the equipment and solvents to be used in each step, and the precautions which will be taken as the work is performed to avoid spread of contamination to other areas. Information given in other portions of the procedures need not be repeated under this heading.
- (o) Final Survey. Before any job is considered completed, a final survey must be conducted in coordination with the plant licensee or contractor (or contractors). The plant licensee should also be asked to perform a survey. The results should be recorded and acknowledged by the signature of the DIS supervisor and an appropriate representative of the licensee. The final survey should include the work area, control area, and adjacent areas.
- (p) Reports. Upon completion of any job, the supervisor will prepare a detailed report, including his service log. This report should be submitted to the Radiation Safety Officer for review and critique of radiological safety and inclusion in his reports.