

Celanese

**ACCIDENT AND FIRE PREVENTION
REFERENCE GUIDE FOR
NEW AND EXISTING PLANTS AND LABORATORIES**

CELANESE CORPORATION OF AMERICA

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**ACCIDENT AND FIRE PREVENTION
REFERENCE GUIDE FOR
NEW AND EXISTING PLANTS AND LABORATORIES**

CELANESE CORPORATION OF AMERICA

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CELANESE CORPORATION OF AMERICA ADMINISTRATIVE PROCEDURES

**ACCIDENT AND FIRE PREVENTION
REFERENCE GUIDE FOR
NEW AND EXISTING PLANTS AND LABORATORIES**

This "Celanese Accident and Fire Prevention Reference Guide for New and Existing Plants and Laboratories" is based on facts and is applicable to our operations. It should be of great help if the information herein is carefully studied and applied.

It is the policy of the Celanese Corporation of America for all our plants and laboratories to plan and conduct all operations safely, thereby preventing injuries to employees and preventing damage to plant property and equipment.

The Corporation Safety Department is part of the Industrial Relations Department and is a staff service, responsible for assisting management and plant and laboratory organizations in the overall accident and fire prevention activities.

Integrating accident prevention and fire protection with all of our operating functions is the direct responsibility of operating management. The authority for preventing accidents and fires on work under their immediate jurisdiction is delegated to all supervisory employees.

The basic objective of the corporate safety policy is to establish, throughout the entire Celanese organization, the firm and fully accepted concept that our employees, plant property and equipment are our most important corporate assets and protection thereof must receive top priority, unqualified support and participation.



Harold Blancke
President

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**CELANESE
ACCIDENT AND FIRE PREVENTION
REFERENCE GUIDE FOR
NEW AND EXISTING PLANTS AND LABORATORIES**

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F O R E W O R D

Accident and Fire Prevention, too often, is believed to be something separate, to be handled only by the Supervisor of Safety and Plant Protection. Actually safety demands the active support of everybody concerned with safe and efficient operation.

This Reference Guide is intended to help Management, Safety and Industrial Relations personnel, to plan and establish practical procedures for eliminating accidents and fires and to provide effective control measures. It defines the principal accident and fire prevention responsibilities and provides information on safe practices and procedures.

Recommendations and procedures set forth herein originate from successful experience in achieving accident and fire prevention. Even though techniques may be various, appreciation of the need for safety work and unceasing pursuit of the best methods are required for its realization. If constructive thinking along these lines is stimulated by this Reference Guide, one of its purposes will have been achieved.

The information on engineering and procedural data is necessarily brief and is not necessarily complete or specific. It may be necessary to refer to the various reference sources listed and to manufacturers' data for more detailed information.

The word "plant" as used in this Reference Guide is intended to include Storage Terminal and Trucking Division.

PART I - SAFETY POLICY - RE-
SPONSIBILITY - ORGANIZATION

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Section 4 SAFETY POLICY, RESPONSIBILITY & ORGANIZATION**A. P. No. 4-100 CELANESE SAFETY PHILOSOPHY****Part I****Effective June 1, 1962**

No plant or laboratory is too large or too small to be entirely free of the possibility of an accident or fire. Consequently, every plant, laboratory, and administrative or sales office is required to actively participate in the accident and fire prevention program.

Our goal is to eliminate the causes of all accidents and fires inherent in our own types of operation and to provide effective control measures.

Starting with the original planning, safety considerations must follow through design, purchasing, fabrication, construction, installation, operation and maintenance involved with all buildings, equipment and processes to assure the highest standards of protection for safeguarding all employees and property and to substantially prevent the possibility of accidents and fires.

Failure in the safety of any operation reflects inefficient operation and could result in pain and suffering for the employee, coupled with needless monetary loss for both the employee and the corporation.

Elimination of unsafe acts demands effective accident and fire prevention organization with full participation of management and education of all employees in safe working habits and practices.

While much of this economic burden is directly carried by the insurance companies, which exist for that purpose, they are actually but intermediaries. The real burden, plus that of operation of the insurance organizations, is ultimately carried by industry.

For detailed information, reference should be made to:

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Section 4	SAFETY POLICY, RESPONSIBILITY, ORGANIZATION		Part I
A. P. No. 4-100	<u>SAFETY ORGANIZATION</u>		
Effective	June 1, 1962		

Safety organization in each plant and laboratory centers on organizational features generally followed by major industrial manufacturing companies and can easily be adapted to meet the needs of any size of plant or laboratory.

Each member of the plant organization, taking his logical place in the safety organization, assumes full measure of his responsibility for the plant or laboratory's safety performance.

In each plant, where it can be justified, a plant safety department is established, headed by a full time Supervisor of Safety and Plant Protection.

In smaller plants and laboratories, with fewer employees, where it is deemed inadvisable to assign a full time Supervisor of Safety and Plant Protection, the safety functions are assigned, on a part-time basis, to a responsible operating individual or included in the function of the Industrial Relations Department.

The Safety Department, whether it is the one headed by a full time Supervisor of Safety and Plant Protection, by the part-time operating individual or by the Industrial Relations Department, serves as Management's right hand in matters of accident and fire prevention and is a staff function.

To direct the activity for the plant as a whole, and to extend safety effectively to the workers the following system of central control for accident and fire prevention has been adopted:

Plant Management Accident and Fire Prevention Committee
Supervisory Accident and Fire Prevention Committee
Departmental Employee Accident and Fire Prevention Committee

The function of each of these committees is briefly explained on the following pages.

For detailed information, reference should be made to:

Celanese Program for Supervisory Training in Accident and Fire Prevention -
Session No. 4 "SAFETY ORGANIZATION"
National Safety Council Accident Prevention Manual for Industrial Operations
National Safety Council Safe Practice Pamphlets No. 42 and No. 47

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Section 4 SAFETY POLICY, RESPONSIBILITY, ORGANIZATION**A. P. No. 4-100 PLANT MANAGEMENT ACCIDENT AND FIRE PREVENTION COMMITTEE****Part I****Effective June 1, 1962**

This committee aids the Plant Manager in the guidance and the coordination of over-all accident and fire prevention activity. It adopts safety standards, safety rules and regulations, and sets the safety policy at the plant.

The Plant Management Accident and Fire Prevention Committee is composed of the Plant Manager, and as applicable, his immediate assistant, superintendent or head of each department, Manager of Engineering, Manager of Industrial Relations, Supervisor of Safety and Plant Protection, and such other key staff members as the Plant Manager may designate. A permanent secretary should be assigned.

Meeting once each month, the Plant Management Accident and Fire Prevention Committee reviews and recommends appropriate action on:

1. Plant accident and fire experience records for the past month.
2. Reports of supervisory, departmental employee, or other safety committee meetings.
3. Problems affecting accident or fire prevention activities.
4. Governmental, provincial or insurance carrier reports and recommendations.
5. Previously reported unsafe conditions or practices that have not been corrected.
6. Training programs in accident and fire prevention and fire fighting.
7. Procedures for orienting new or transferred employees in the proper attitude toward safe operating practices.
8. Installation of safeguards, provision of personal protective equipment, and such operating improvements as will provide maximum protection for plant properties, equipment and employees.

(Continued on Page 6 - Part I)

For detailed information, reference should be made to:

Celanese Program for Supervisory Training in Accident and Fire Prevention -
Session No. 4. "SAFETY ORGANIZATION"

McGraw Hill; Industrial Accident Prevention; H. W. Heinrich

Prentice Hall; Industrial Accident Prevention; R. P. Blake

MacMillan; Accidents and Their Prevention; H. M. Vernon

Part II - Page 17; "Information from Monthly Meetings of Plant

Management Accident and Fire Prevention Committees."

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A. P. No. 4-100	<u>SUPERVISORY ACCIDENT AND FIRE PREVENTION COMMITTEE</u>	
Effective	June 1, 1962	

Each Superintendent or Department Head will direct his supervisory Accident and Fire Prevention Committee composed of selected supervisory personnel.

This committee meets not less than once each month and is responsible for carrying on the accident and fire prevention activity in the department. Standards, policies, and other decisions formulated by the Plant Management Accident and Fire Prevention Committee are enacted and enforced by this committee.

Reports of departmental employee safety committee meetings are reviewed and reports of accidents and fire investigations; detection and correction of unsafe practices or conditions; training employees in safe working methods; and follow-up and enforcement of accident and fire regulations are discussed at each meeting of this committee.

Minutes are recorded at each meeting and forwarded to interested personnel.

Plant Supervisor of Safety and Plant Protection serves this committee in an advisory capacity.

For detailed information, reference should be made to:

Celanese Program for Supervisory Training in Accident and Fire Prevention -
Session No. 4 "SAFETY ORGANIZATION"

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Section 4 SAFETY POLICY, RESPONSIBILITY, ORGANIZATION**A. P. No. 4-100 SPECIAL SAFETY COMMITTEES****Part I****Effective June 1, 1962****Accident or Injury Investigation Sub-Committee:**

In cases of fatality, or cases resulting in permanent disability, the accident should be thoroughly investigated, usually by an investigation committee appointed by the Plant Manager. This committee would include the Department Superintendent, the Plant Manager of Engineering or Section Engineer, the immediate Foreman or Supervisor of the injured and the Supervisor of Safety and Plant Protection.

Inspection Committee:

When the Plant Management Safety Committee deems it necessary to conduct special inspections to determine the need for mechanical safeguards, safety equipment, personal protective equipment, or to check on condition of equipment, ladders, floors, exits, machinery or similar demands, this specially appointed sub-committee proves most helpful. It could also serve to report on condition of housekeeping and maintenance and check on enforcement of safety regulations.

For detailed information, reference should be made to:

Celanese Program for Supervisory Training in Accident and Fire Prevention -
Session No. 16 "ACCIDENT INVESTIGATION"

National Safety Council; Accident Prevention Manual for Industrial Operations

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Section 4 SAFETY POLICY, RESPONSIBILITY, ORGANIZATION**A.P. No. 4-100 PLANT SUPERVISOR OF SAFETY AND PLANT PROTECTION****Part I****Effective June 1, 1962**

The Plant or Laboratory Supervisor of Safety and Plant Protection is responsible for advising and assisting Plant Management in the administration of an effective safety program. He is in charge of the security of the plant and its employees which includes accident prevention, fire prevention, fire fighting, watchman and guard activities, plant emergency protection and civilian defense.

The Supervisor of Safety and Plant Protection will:

- a) Organize the Plant Accident, Fire Prevention, Emergency Protection and Plant Security organization.
- b) Plan and conduct those programs at the plant.
- c) Know potential hazards and exposures that may exist in each department or area throughout the plant. Recommend and enforce measures for control.
- d) Constantly inspect the plant for determination and correction of unsafe acts and unsafe conditions.
- e) Work closely with Engineering, Research, Development and Manufacturing organizations in new building construction, new processes or modification of existing buildings and processes.
- f) Review plant drawings for adequacy of safety and fire prevention features.
- g) Check new installations to determine safe operation.
- h) Maintain records for determination of accident trends and for individual repeaters. Code and review all accident histories and keep medical records current.
- i) Investigate all fires, explosions, spills, escaping vapors, or such

(Continued on Page 12 - Part I)

For detailed information, reference should be made to:

Calanese Program for Supervisory Training in Accident and Fire Prevention -
Session No. 4 "SAFETY ORGANIZATION"

National Safety Council; "Accident Prevention Manual for Industrial Operations"
National Safety Council; "Safe Practice Pamphlet No. 84"

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Section 4	SAFETY POLICY, RESPONSIBILITY, ORGANIZATION
A. P. No. 4-100	<u>PLANT SUPERVISOR OF SAFETY AND PLANT PROTECTION</u>
Effective	June 1, 1962

Part I

- r) Conduct plant's "off-the-job" safety activity.
- s) Assure that new employees are given an understanding of the Corporation's attitude toward accident and fire prevention.
- t) Post and keep up to date - safety rules, "No Smoking" signs, posters, bulletins and safety or fire prevention announcements.
- u) Investigate all "safety suggestions" and make recommendations pertaining to them.
- v) Keep up to date on the development of new safety devices.
- w) All purchasing of safety equipment should be approved by the Supervisor of Safety and Plant Protection or the individual responsible for accident and fire prevention activities.
- x) Accompany state, insurance, and other authorized inspectors on plant surveys and determine validity of recommendations as measured by good safety and health standards.
- y) Investigate claims for personal injury and authorize payment of compensation as governed by the Workman's Compensation Act.
- z) Discuss written reports of Factory Insurance Association resulting from inspections.
- aa) Direct and constantly review the effectiveness of the various permit systems operating through the Safety Department, i.e., fire permit, tank entry permit, electrical permit.
- ab) Authorize payment of medical bills, bus fare, broken glasses, broken teeth, and prescriptions when circumstances indicate Management responsibility.

(Continued on Page 14 - Part I)

For detailed information, reference should be made to:

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Section	4	SAFETY POLICY, RESPONSIBILITY, ORGANIZATION
A. P. No.	4-100	<u>SAFETY REGULATIONS</u>
Effective		June 1, 1962

Part I

Each plant and laboratory prepares its own safety regulations in compliance with corporate standards. These regulations are usually typed or printed for distribution to employees as well as posted at strategic locations. Some of the plants have published pocket sized safety manuals for employees. These manuals include the general safety regulations, together with other general information for employee use.

Safety regulations, particularly developed to cover certain specific operations or departments have proved practicable. These regulations, because of the nature of the operation or department, usually are more detailed than the plant's overall safety regulations.

For detailed information, reference should be made to:

National Safety Council; "Accident Prevention Manual for Industrial Operations"
National Safety Council; "Safe Practice Pamphlet No. 80"

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Section 4 SAFETY POLICY, RESPONSIBILITY, ORGANIZATION

A.P. No. 4-100 COMMERCIAL HAZARDS COMMITTEE

Part I

Effective June 1, 1962

The Commercial Hazards Committee evaluates the hazards involved in the manufacture and sale of any chemical or other corporation product and decides what action the corporation will take to guard against any hazards involved. It is organized to advise and answer inquiries regarding toxicological hazards, sound industrial hygiene practices and determinations as to flammability, explosion or corrosion arising from the use or handling of the product.

This committee decides whether and what commercial hazards may exist; whether and what toxicological or dermatitic tests should be performed; what precautions shall be required of employees handling the product within the corporation; what warnings are desirable in technical or sales bulletins and to recommend appropriate, properly worded labels.

It is the responsibility of the Safety Department to carry out the recommendations, where appropriate, of the Commercial Hazards Committee.

For detailed information, reference should be made to:

Procedural Circular; "Procedure for Handling Matters Relating to Commercial Hazards,"
October 12, 1956; revised August 1, 1957

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Section 4 SAFETY EDUCATION

A. P. No. 4-100

PROGRAM FOR SUPERVISORY TRAINING IN ACCIDENT AND
FIRE PREVENTION

Effective

June 1, 1962

PART II

This program was developed to provide assistance to all management and supervision with information that should encourage them to exert every effort and ingenuity and resource in preventing accidents and fires. Emphasis is placed on supervisory responsibility for perpetual and systematic control and examination and elimination of the causes of accidents and fires. It helps prepare supervision to function well, willingly and with understanding within the framework of their own individual situation.

Subjects covered in the Program have corporation-wide application and are procedures or practices that have been adopted and are standard practice.

The material for each of the twenty-five sessions, together with the Instructor's Guide, is distributed by the Director of Safety and Plant Protection, Charlotte, N. C.

In addition to the Celanese Program for Supervisory Training in Accident and Fire Prevention, it is recommended that supervision participate in outside courses. In some areas, safety courses are offered by colleges as evening subjects. Local chapters of the American Society of Safety Engineers and community safety councils have developed courses for supervisors.

Prepared courses, complete with instructors guides are available and can be adapted to local needs. The National Safety Council offers a Home Study Course, "Supervising for Safety."

For detailed information, reference should be made to:

National Safety Council; "Accident Prevention Manual for Industrial Operations"

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Section 4	SAFETY EDUCATION	
A. P. No. 4-100	<u>ORIENTATION PROGRAM</u>	Part II
Effective	<u>NEW (AND TRANSFERRED) EMPLOYEE</u> June 1, 1962	

A carefully planned introduction to the plant or laboratory safety program should be developed. All new employees, staff and hourly, should be oriented in accident and fire prevention by the Supervisor of Safety and Plant Protection.

The employee's immediate supervisor gives further induction training - a full and complete explanation of the hazards incidental to the man's or woman's work, the rules and procedures for accident and fire prevention, instruction in the use of safety devices and personal protective equipment.

Form Gen-1675, Safety Check List, has been provided to assure that safety orientation of new employees, and re-instruction of transferred employees, will be properly emphasized and that every effort will be made to assist the employee in developing a good safety attitude.

It must be made clear to each employee that he is expected to know and observe all safety regulations and safety instructions just as seriously as any other plant, company or corporate directives. Observing safety precautions should be regarded as part of the requirements of the job, not as suggestions to be followed unless he or she is willing to bear a personal risk.

For detailed information, reference should be made to:

Celanese Program for Supervisory Training in Accident and Fire Prevention;
Session 5 - "THE NEW WORKER"

National Safety Council; "Accident Prevention Manual for Industrial Operations"
National Safety Council; "Safe Practice Pamphlet No. 65"

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Section 4	SAFETY EDUCATION	Part II
A. P. No. 4-100	<u>SAFETY CONTESTS</u>	
Effective	June 1, 1962	

Some form of in-plant competition or contest is recommended. Participation in a contest usually helps arouse and maintain employee interest.

When competing in a contest, accidents must be reported strictly according to the contest rules. The scoring plan must be equitable and the contest should be given adequate publicity. The period of the contest should be clearly stated. An award should be offered, preferably one which can be shared by all employees in the winning group.

One desirable method of establishing a contest scoring plan and a basis of comparison takes into consideration the number of employees in each competing unit. Frequency Rates, based on chargeable injuries, computed in accordance with the American Standards Method of Measuring and Recording Work Injury Experience, would be one method of scoring. Established goals in man-hours worked without any Lost Time Injury in a department or group also has merit.

In establishing plant safety contests, every effort should be made to assure that the established quota in man-hours or days worked will be an attainable goal.

For detailed information, reference should be made to:

National Safety Council; "Safe Practice Pamphlet No. 74"

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Section 4 SAFETY EDUCATION**A. P. No. 4-100 SAFETY POSTERS****Effective June 1, 1962****Part II**

National Safety Council posters are obtained by the Director of Safety and Plant Protection. Plants and laboratories select the posters they want from the National Safety Council poster catalog or National Safety News magazine. Selections and quantities are then forwarded to the Corporate Safety Department, who obtains the posters and distributes them to the plants and laboratories.

National Safety Council posters are charged to the Director of Safety and Plant Protection's budget. For budgeting reasons, a yearly quota is allocated to each plant and laboratory. Posters, in excess of this allotment, required by any plant or laboratory, may be purchased by the plant direct from the National Safety Council. Such direct purchases are to be absorbed by the plant budget.

Poster allotments are reviewed annually. In June of each year the revised poster allotment announcement will be prepared and distributed to all plants and laboratories.

For detailed information, reference should be made to:

Celanese Program for Supervisory Training in Accident and Fire Prevention -
Session No. 7 - "AROUSING AND MAINTAINING SAFETY CONSCIOUSNESS"
National Safety Council; Accident Prevention Manual for Industrial Operations
National Safety Council; Safe Practice Pamphlet No. 38.
National Safety Council; Directory of Occupational Safety Posters

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Section 4 SAFETY EDUCATION

A. P. No. 4-100 SAFETY ACTIVITIES OUTSIDE THE PLANT

Part II

Effective June 1, 1962

Participation in community safety activities is encouraged. Plant and laboratory safety personnel should take an active part in State-wide Industrial Safety Conferences; local chapters of the American Society of Safety Engineers; National Safety Congress; safety lectures, conferences, and workshops conducted locally by the Manufacturing Chemists' Association, American Management Association and similar safety and technical organizations.

For detailed information, reference should be made to:

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Section 4	SAFETY EDUCATION	Part II
A. P. No. 4-100	<u>HOUSEKEEPING</u>	
Effective	June 1, 1962	

This is actually the first and basic element on which to build successful accident and fire prevention. Because bad housekeeping creates accident and fire hazards it must be carefully planned and controlled. With good housekeeping many fire and accident hazards are automatically eliminated. The effect of good housekeeping upon the employee is immediate. He will perform better work in a clean plant and he will keep it clean.

The essentials of good housekeeping are generally reduced to the principle of a "proper place for everything and everything in its proper place". This implies a common-sense system on the part of all personnel, from top management down to the janitor, for maintaining an orderly environment and working procedure inside and outside the plant.

In addition to removal of rubbish and debris in which fire might start, on the plant or laboratory grounds, good housekeeping considerations would include care of the buildings and equipment, electrical installations, tools and equipment, elevator safety, office safety, and keeping the plant grounds in clean condition, painting, illumination, sanitation and all things which encourage the employee to take pride in the place in which he works. Among other things this would involve dust and fume removal systems, storage and handling of materials, waste disposal, prevention of leaks, drips and spills, and the maintenance of cleanliness and orderliness throughout the plant or laboratory and all its operation, with particular emphasis on lunch rooms, rest rooms and change houses.

Regular housekeeping inspections should be scheduled and employees should be encouraged to report any unsafe conditions. Foremen and supervisors particularly should inspect their departments constantly.

Some plants encourage employees to maintain good housekeeping conditions by competitive housekeeping contests. Some plants have established housekeeping inspection committees composed of supervisors only, some prefer committees of supervisors with hourly workers who serve for limited terms so as to bring as many as possible into the activity.

The importance of good housekeeping demands fullest publicity and discussion to assure that all employees are constantly reminded that the highest standards of good housekeeping must be maintained at all times.

For detailed information, reference should be made to:

Celanese Program for Supervisory Training in Accident and Fire Prevention -
Session No. 13. - "PLANT HOUSEKEEPING AND MAINTENANCE"
National Safety Council; Accident Prevention Manual for Industrial Operations.
National Safety Council; Safe Practices Pamphlet No. 45.
National Fire Protection Association; Inspection Manual

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Section 4 SAFETY EDUCATION
A.P. No. 4-100 PURCHASING FOR SAFETY
Effective June 1, 1962

Part II

A cooperative arrangement should be established at each plant or laboratory to assure that all materials and equipment entering the plant or laboratory will meet the desired objective of fullest safety and fire prevention. Such a procedure, when applied, will reduce the necessity for alterations or other improvements of the equipment after it has been installed. It will help guarantee safest handling and storage of hazardous materials.

If the Supervisor of Safety and Plant Protection is unable to accurately check specifications for inherent hazards, he should seek assistance from the plant engineering department or plant chemist and from the Director of Safety and Plant Protection.

It is essential that there be close cooperation between the Supervisor of Safety and Plant Protection, Purchasing, Engineering, Development and Production Departments.

In Celanese Corporation of America, all accident and fire protection equipment must conform to established, accepted standards.

For detailed information, reference should be made to:

Celanese Program for Supervisory Training in Accident and Fire Prevention -
Session No. 9 - "LAY-OUT AND ARRANGEMENT"
National Safety Council; "Safe Practice Pamphlet No. 103"

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Section 4 SAFETY EDUCATION

A.P. No. 4-100 CELANESE SAFETY PROGRESS REPORT

Part I:

Effective June 1, 1962

Designed to stimulate accident and fire prevention activity at points of operation, this Progress Report points out spectacular incidents and provides data that will aid Plant Safety organizations. It is the voice of the Program, distributed each month to all executive, management and supervisory personnel including the Foreman level.

It offers comparative standing of Lost Time Injury experience and Fire experience of all plants and laboratories, sifts and interprets accident and fire cause trends. Specific objectives are pointed out, and seasonal or timely precautions are announced.

It links widely separated plants and laboratories in the united effort and gives local plant organizations the chance to keep up with new developments for safeguarding materials and equipment as well as the workers.

Editorials and contributions from the plant organizations, press releases or publications from outside sources that may be of particular value to plant safety organizations are included in this report. An important function of this Progress Report is to illustrate or demonstrate safe practices in use at the plant or laboratory.

The Safety Progress Report is printed each month in sufficient quantity to supply each Plant or Laboratory with enough copies to distribute a copy to all management and supervisory personnel to the Foreman level. Information on number of copies needed to meet requirements for such distribution should be forwarded to the Director of Safety and Plant Protection, Charlotte, N. C.

For detailed information, reference should be made to:

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Section 4 SAFETY EDUCATION

A. P. No. 4-100 INFORMATION FROM MONTHLY MEETINGS OF PLANT MANAGEMENT
ACCIDENT AND FIRE PREVENTION COMMITTEES

Part II

Effective June 1, 1962

Minutes of Plant Management Safety Committee meetings are forwarded to Director of Safety and Plant Protection, Charlotte, N. C., who selects the portions to be incorporated in this "Information from Plant Management Safety Committee Meetings." In January, April, July, October, the highlights of the information extracted from the minutes will be distributed to all plants and to interested executives.

Normal distribution to the plant or laboratory is one copy to the Plant Manager and one copy to the Supervisor of Safety and Plant Protection at each plant and laboratory. Additional copies, if wanted, may be obtained by request to Director of Safety and Plant Protection, Charlotte, N. C.

For detailed information, reference should be made to:

Part I, Pages 5-6 - "Plant Management Accident and Fire Prevention Committees."

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Section 4 SAFETY EDUCATION**A. P. No. 4-100 CELANESE SAFETY INFORMATION BULLETIN****Part II****Effective June 1, 1962**

These bulletins cover the widest range of subjects. They bring to the attention of management and supervision practical procedures or information that might be considered for plant adoption to prevent accidents or fires.

Normal distribution is one copy to the Manager of Engineering and one copy to the Supervisor of Safety and Plant Protection at each plant. Additional copies may be obtained by request to the Director of Safety and Plant Protection, Charlotte, N. C.

For detailed information, reference should be made to:

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Section 4 SAFETY EDUCATION
A. P. No. 4-100 NEAR MISS ACCIDENT BULLETIN
Effective June 1, 1962

Part II

To help all plants and laboratories take full advantage of the knowledge and experience gained, each near-miss accident reported by a Celanese plant or laboratory will be reproduced in the bulletin form found on the preceding page.

Copies of this bulletin are distributed in the needed quantity to all plants and laboratories.

The plant or laboratory at which the "near-miss" accident occurred will not be identified on this form.

For detailed information, reference should be made to:

Part XII - Page 23; "Reporting (Near Miss) Accidents."

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Section 4 SAFETY EDUCATION
A. P. No. 4-100 OFF-THE-JOB SAFETY
Effective June 1, 1962

Part II

This intensive program for reducing accidents to employees and their families is an integral part of the overall accident and fire prevention program. It is emphasized at all plants and laboratories.

The number of deaths and injuries resulting from accidents while outside the jurisdiction of the plant or laboratory is many times greater than results from accidents on the job. The pain and suffering and costs involved are very real to the employee, to his family and to the corporation.

The objective for each plant organization is to assume leadership in promoting the safety of employees while off the job and their families. The nature of the program is persuasive and educational. It is aimed at developing knowledge, not so exact as mechanical or electrical engineering, but exact enough to present specific knowledge designed to convince employees, of their own volition, to think safety at all times.

The Corporate Safety Department maintains the corporate statistical records for off-the-job accident experience based on the information submitted by the plants and laboratories as outlined in Part XII of this Guide. An appropriate off-the-job safety poster listing the plant experience is prepared and distributed to the plants each quarter.

Occasional and timely information and materials are prepared by the Corporate Safety Department and distributed to plant and laboratory safety organizations to help promote special campaigns, such as, automobile safety seat belts, Fire Prevention Week, vacation safety and holiday safety observance.

For detailed information, reference should be made to:

Manufacturing Chemists' Association; Safety Guide SG-11; "Off-the-Job Safety"

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OBSERVATION PLAN

It's Scope and Function

PURPOSE: Much of our Accident Prevention activities have, of necessity, been concerned with procedures which follow the occurrence of an accident, i. e. Investigations; Detailed Reports; Compilation of Statistical Data; Dissemination of Educational Literature! All based on past experience, and all aimed at the prevention of similar accidents in the future.

This phase of Accident Prevention serves its purpose well, and will continue to do so, yet it is not the final and complete answer to real Accident Prevention. Being based on past experience, it does not come into operation until after an accident occurs; after a high price has already been paid in human suffering or even death.

The OBSERVATION PLAN works from the opposite end - BEFORE the occurrence of an accident. It strikes at the cause of accidents - UNSAFE PRACTICES. In doing this, it serves a two-fold purpose, namely:

- 1) To detect and eliminate UNSAFE PRACTICES before an accident is caused by reason of such practices.
- 2) To instill in all supervisors the habit of being on constant guard against unsafe practices, by spotting and eliminating them immediately.

HOW THE PLAN WORKS:

Supervisors, or Foremen, usually recognize the danger of unsafe practices when and if they are detected. In many cases, alert supervisors have been able to spot an unsafe practice before an injury results, yet in too many instances, the unsafe practice has only been uncovered after the injury has first focused attention on it.

The OBSERVATION PLAN places the detection of UNSAFE PRACTICES on an organized basis. Recognition of unsafe practices is not left to chance. Under this plan the supervisor takes time to stand aside once a week for the single purpose of watching for

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EXHIBIT

unsafe working practices among his employees. He looks for nothing else during this OBSERVATION PERIOD. He concentrates on UNSAFE PRACTICES. He then records the results of his OBSERVATION on the report form supplied him for the purpose. This report is then discussed with the Supervisor of Safety and Plant Protection or the individual in charge of plant safety. A copy of each Observation Report should be submitted to the Plant Safety Department.

LENGTH OF OBSERVATION PERIOD:

This depends on the nature of the job being performed at the time - the Supervisor makes his OBSERVATION.

For example: In the storage of bagged material the Foreman should not conclude his OBSERVATION after he has seen several bags of material stored, but should continue the OBSERVATION until a pile reaches the height of five feet where it should be stepped back one row, and then should be stepped back one row for each additional three feet of height.

He should endeavor to cover a complete operation.

For another example:

A Supervisor or Foreman may choose to make an OBSERVATION covering the use of a ladder by one of his men. Accordingly, it can be seen that some observations can be satisfactorily completed in a short time, while others will require longer periods of time in order to obtain an accurate "sample." However, in most cases an OBSERVATION PERIOD of from fifteen or twenty minutes will prove sufficient.

FREQUENCY OF OBSERVATIONS:

The Plan is flexible enough to allow for as many OBSERVATIONS over a stated period of time as may be desired by local Plant Management.

However, for all practical purposes, it is recommended that each Supervisor and Foreman should make at least one OBSERVATION per week.

NUMBER OF EMPLOYEES OBSERVED:

An OBSERVATION may be made any time, anywhere, any place one or more employees are engaged in a work procedure. In many cases an OBSERVATION will cover only one man, while at other times, due to the nature of the work being performed, and where the proper co-ordination of several men is involved, the observation may cover an entire crew.

The SUPERVISOR should plan his OBSERVATIONS in such a manner that all his employees are more or less equally covered over a given period of time.

MONTHLY SUMMARY:

The Monthly Summary provides Executives in Charge of locations with a quick resume of the OBSERVATIONS made.

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This report should be compiled by the Plant Safety Department or the individual in charge of safety from the individual OBSERVATION Reports submitted by the Supervisors of the plant's safety committee, and is intended to be used as a basis for discussion at the regularly scheduled meetings.

The individual OBSERVATION Reports should be attached to the Summary Sheet so that the results of any observation may be discussed in detail.

The Summary Report will indicate those categories in which UNSAFE PRACTICES are involved most frequently, thereby pointing the way for future concentration in efforts to train employees in correct and safe working procedures.

VALUE OF THE PLAN:

The OBSERVATION PLAN should uncover countless UNSAFE PRACTICES. Many of these practices will be obvious and familiar, recognized by all. On the other hand, UNSAFE PRACTICES will be observed and reported that have heretofore been overlooked, perhaps not even considered as being capable of causing an accident.

This is because we, as individuals, do not always see and recognize the same situation. By a pooling of such OBSERVATIONS, the experience and information gained will be of use to all. For this reason, the discussions coming from the Plant Management Safety Committee meetings should be carried back by the Supervisors to their own Supervisory Foreman and Departmental Employee Safety Meetings. In this way, the benefits of the Plan will reach each individual employee.

CONCLUSION:

The success of the Plan depends on a full understanding of its purposes by all those concerned.

Although its use cannot help but bring about an improvement in work procedures, the Plan is not intended to serve as a check on the efficiency of an individual employee.

Its sole aim is to prevent tomorrow's accidents by spotting and eliminating today's UNSAFE PRACTICES.

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Section 4**SAFETY EQUIPMENT****A.P. No. 4-100****PERSONAL PROTECTIVE EQUIPMENT****Part III****Effective****June 1, 1962**

Cost of personal protective equipment represents an important industrial economic consideration. To keep such costs at a respectable level, closest cooperation between Purchasing, Production, Engineering and Safety Departments is required. Only the correct type of equipment designed to protect against the respective job hazard should be purchased. All personal protective equipment must comply with usage specifications established by authoritative and recognized approval agencies.

Supervision and department heads should exert every effort to assure that the employees use the equipment properly and do not abuse, destroy and lose the personal protective equipment provided for their protection.

Personal protective equipment should be stocked carefully, kept clean, and if of the type which is returned to the stock room or safety warehouse, it should be sterilized before any re-issue.

Some plants find it is economical and most efficient to stock and maintain personal protective equipment in a safety warehouse, together with all plant owned safety equipment. It eliminates the practice of each department purchasing individual safety equipment. It simplifies standardization on all safety equipment items. Purchasing, cleaning, sterilizing and repairing safety equipment through the Safety warehouse presents opportunity for important savings.

For example; where it had been practice to use a gas mask canister one time and then discard it, it is not uncommon now to use a canister for six months. Instead of a dozen different kinds of respirators or goggles the items have been standardized. Instead of throwing away equipment in need of repair, replacement parts are kept at hand and individuals are instructed to return safety equipment in need of repair. This returned equipment is properly reconditioned, sterilized and re-used. After use, safety equipment that is not issued to an individual is returned to the safety warehouse where it is exchanged for the same item that has been repaired, cleaned and sterilized.

If at all possible, consideration should be given to standardizing basic safety items.

(Continued on Page 2 - Part III)

For detailed information, reference should be made to:

National Bureau of Standards; "Circular 471"

National Safety Council; "Accident Prevention Manual for Industrial Operations"

National Safety Council; Data Sheet D-444; "Respiratory Protective Equipment"

National Safety Council; "Safety Belts, Harnesses and Accessories"

National Safety Council; "Plastic Eye Protectors"

U. S. Department of Commerce; Commercial Standards CS-129-47; "Materials for Safety Wearing Apparel"

U. S. Treasury Department; Federal Standard Catalog; "Specifications for Specific Items"

American Industrial Hygiene Association; "Hygienic Guide Series on Various Chemicals"

(Additional references on Pages 2 & 3 - Part III)

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Section 4	SAFETY EQUIPMENT	Part III
A. P. No. 4-100	<u>PERSONAL PROTECTIVE EQUIPMENT</u>	
Effective	June 1, 1962	

Use of the canister type mask is not approved in areas where there is liable to be a deficiency of oxygen.

Wherever possible, air line masks, fresh air masks, self-contained oxygen breathing masks and masks that are attached to oxygen cylinders should be used instead of the canister type mask.

All safety equipment is issued to an individual on a loan basis. On termination and separation, as part of the clearance procedure, he clears through the safety warehouse. If an item is not returned it is charged against his final check.

For detailed information, reference should be made to:

Bureau of Mines; "Use of Respiratory Devices Under Abnormal Air Pressure"
Bureau of Mines; "Information Circular 7236; Selection, Use and Maintenance of Respiratory Protective Devices"

001811

Section 4	SAFETY EQUIPMENT
A. P. No. 4-100	<u>EMERGENCY LIGHTING</u>
Effective	June 1, 1962

Part III

Emergency lighting is designed to provide sufficient illumination to allow safe and orderly evacuation of personnel, and to permit operation of critical valves and switches.

There are a number of reasons why regular lighting may fail. It could result from a circuit overload, from a short circuit, from serious flooding, from an explosion or other accident. Emergency lighting is needed in the event all or part of the regular lighting fails. This is essential in day-time hours as well as night-time hours.

Emergency lighting should be automatically actuated and should operate from an independent connection, from an approved battery system or from an emergency generator.

In general emergency lighting is concerned with providing temporary illumination for stairways, aisles and exits should the regular lighting fail in the working areas. Particularly important are plant dispensaries, first aid rooms, cafeterias and their exits.

For detailed information, reference should be made to:

National Safety Council;- Data Sheet D-248 "Emergency Lighting"

001813

001815

Section 4 INSPECTION - INSURANCE
A. P. No. 4-100 - INSURANCE INSPECTION REPORTS; SAFETY
Effective June 1, 1962

Part IV

Plant inspections are made by American Motorists Insurance Company.

The insurers distribute copies of each inspection report as follows:

- Two copies to Insurance Manager
- One copy to Corporate Director of Safety and Plant Protection, Charlotte, N.C.
- One copy to Plant Manager
- One copy to Plant Manager of Engineering
- One copy to Plant Supervisor of Safety and Plant Protection
- One copy to Insurance Brokers

Plant Supervisor of Safety and Plant Protection will inform affected plant personnel.

Comments or reports of action taken on the inspection reports are the responsibility of Plant Supervisor of Safety and Plant Protection. He will answer correspondence with:

- Original and one copy to the Corporate Director of Safety and Plant Protection who will forward one copy with his comments to the Insurance Manager.
- One copy to the Plant Manager.
- Copies to affected plant personnel.

Return comments from insurers, if any, and if applicable, will be submitted through routine channels.

For detailed information, reference should be made to:

"Insurance Manual" issued by the corporate Insurance Department

001816

Section 4 INSPECTION - INSURANCE**A. P. No. 4-100 INSURANCE INSPECTION REPORTS; FIRE****Part IV****Effective June 1, 1962**

matters may be handled directly between the Plant Manager of Engineering and the nearest office of the insurance company. All items, however, which are commented on in the F.I.A.'s inspection report must be handled through the Corporate Director of Safety and Plant Protection.

At times, the Plant or Company Engineering Departments require advice from the Head Office of the insurer. This should be obtained through the Corporate Director of Safety and Plant Protection, who will inform the Insurance Manager, who in turn advises broker to get reply from F.I.A. The information thus obtained is sent back through these same channels.

The Plant Manager of Engineering (or his assistant) may directly seek advice from the insurance company field or territory representative. Whenever definite steps are planned, however, all personnel affected must be informed with a brief review and justification.

For detailed information, reference should be made to:

Page 2 - Part IV

001818

Section 4 INSPECTION - INSURANCE**A. P. No. 4-100 INSURANCE INSPECTION REPORTS; BOILER AND MACHINERY****Part IV****Effective June 1, 1962**

or information from the Head Office of the insurer. This should be obtained by directing inquiry through the usual channels, i.e., Corporate Director of Safety and Plant Protection, who will inform the Insurance Manager, who in turn instructs broker to get reply from the American Motorists Insurance Company. The information obtained is sent back through these same channels.

The Plant Manager of Engineering (or his assistant), may directly seek advice from the insurance company field or territory representative. Whenever definite steps are planned, however, the Corporate Director of Safety and Plant Protection and all personnel affected must be informed with a brief review and justification.

For detailed information, reference should be made to:

Page 4 - Part IV

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Section 4	INSPECTION - INSURANCE	Part IV
A. P. No. 4-100	<u>INSURANCE INSPECTION RECOMMENDATIONS</u>	
Effective	June 1, 1962	

Recommendations included in the insurance inspection reports are of utmost importance. Within thirty days after receiving the insurance inspection report, comments by plant or laboratory organizations should be forwarded in duplicate to the Director of Safety and Plant Protection, Charlotte, N.C.

If unable to comment on recommendations at the end of thirty days, a note or letter, in duplicate, explaining what progress is being made on recommendations, should be forwarded to the Director of Safety and Plant Protection, Charlotte, N. C.

For detailed information, reference should be made to:

"Insurance Manual" issued by the corporate Insurance Department

001822



Section 4 INSPECTION - INSURANCE

A. P. No. 4-100 PLANS FOR PLANT FIRE PROTECTION SYSTEM

Part IV

Effective Revised April 30, 1970

When fire protection has been designed for a new plant or modification or additions contemplated for existing plants, our insurers must be given the opportunity to review such plans prior to installation or modification.

As soon as the engineering drawings are available, four copies should be sent to the corporate director of safety and plant protection, who will forward three copies with his comments to the F.I.A. One copy of drawing and transmittal letter is sent to the broker. A copy of the transmittal letter only is directed to the insurance manager.

The broker sends copy, bearing stamp of approval by F.I.A to the corporate director of safety and plant protection.

Corporate director of safety and plant protection will forward the approved plans and specifications to the plant concerned.

Should F.I.A. fail to approve, or approve only on condition that certain modifications or additions are made, corporate director of safety and plant protection is so informed by the broker.

Corporate director of safety and plant protection so informs plant engineering manager and, as in the case of new plants, all other personnel affected.

Procedure to be Followed Before Making Any Installation Which Would Increase Fire or Explosion Hazards

If any proposed installation increases the fire or explosion hazard of the area, the plant engineering manager and supervisor of safety and plant protection must obtain the approval of the corporate director of safety and plant protection before permitting such installations.

To obtain the insurance company approval, it is necessary that details be submitted by the plant engineering manager through channels outlined in the

(Continued on Page 10 - Part IV)

For detailed information, reference should be made to:

AP-5 issued by the corporate Insurance Department
Page 8 - Part IV - "Procedure for New Project"
Letter: SD-65-8-JMM - January 12, 1965

001824

001826



Section	4	PERMIT SYSTEMS
A. P. No.	4-100	<u>THE SAFE WORK PERMIT</u>
Effective		June 1, 1962

Part V

The real purpose of any of the safety permits described on the following pages, is to assure that any hazardous job will be made as safe as possible by getting everyone concerned to approach the work with safety in mind. A permit, in itself, is no better than the thought and intent that goes into issuing it. It is really a check list that can assure the maintenance, the production, and the accident and fire prevention people that the job has been prepared with considerable thought given to safety.

Whoever accepts any of the permits described on these pages has the definite responsibility of checking the job for safety. However, the real responsibility for assuring that every precaution is taken when preparing any hazardous job, rests on the person issuing the permit. The reason for this is obvious. He should know more about the safety precautions than any other person.

A permit is not intended to usurp the authority and responsibility of the supervisor on the job. Issuing the permit is intended to assist him in making the job as safe as humanly possible.

For detailed information, reference should be made to:

001827

Section 4 PERMIT SYSTEMS
A. P. No. 4-100 TANK ENTRY PERMIT
Effective June 1, 1962

Part V

No person or persons shall enter storage tanks, tank cars, blowcases, pressure vessels, storage bins, or confined spaces until such places have been tested by qualified safety personnel and declared safe for personnel.

Each plant and laboratory organization is required to use the established corporate procedure to be followed for entering any tank, tank car, enclosed vessel or any confined space. Use of a tank entry permit is mandatory.

The recommended form for the tank entry permit, "Approval Sheet for Work In Tanks or Confined Spaces," is found on the preceding page. This form provides a check-list that is used to help assure adequate inspection and preparation of the tank and the provision of proper safety equipment. It is formal written authorization for the work to proceed only after the supervisor in charge of the department or area is personally satisfied that the tank preparation is adequate; that every precaution has been taken; that proper personal protective equipment has been provided and that everyone concerned with the work has been properly informed and instructed.

It is the responsibility of the supervisor to whose department or area the tank is assigned to see personally that the tank is in safe condition for entry and that the person to enter is fully informed on the hazards of the job and understands the precautions to be taken.

Tank cleaning and the procedure for tank entry permits is explained in detail in Session No. 25 of the Celanese Program for Supervisory Training in Accident and Fire Prevention.

For detailed information, reference should be made to:

John G. Simmonds & Co., Inc.; "Safety in Petroleum Refining and Related Industries" by George Armistead, Jr.

American Petroleum Institute; "Accident Prevention Manual 1 A and 1 B
Manufacturing Chemists' Association; Safety Guide SD-10; "Entering Tanks and Other
Enclosed Spaces"

Celanese Program for Supervisory Training in Accident and Fire Prevention -
Session No. 25 "TANK CLEANING"

National Safety Council; "Safe Practices" Pamphlets No. 25 and Chem. 1

National Safety Council; "Accident Prevention Manual for Industrial Operations"

001829

Section 4 PERMIT SYSTEMS

A. P. No. 4-100 FIRE PERMIT

Part V

Effective June 1, 1962

Each plant and/or laboratory is required to establish a Fire Permit system to cover burning and welding operations and any work involving heat producing devices in areas containing flammable liquids, gases and combustible dusts. No burning or welding is permitted without authorization. This is a very, very necessary procedure for preventing fires and assuring that everybody concerned knows that a burning or welding operation is being performed.

While no standardized form or procedure has been prescribed, all the plants and laboratories have adopted procedures based on local plant conditions.

For example, the current procedures essentially begin with the application for the burning or welding. This application is made by the Section Engineer and forwarded to the plant safety department. The Fire Chief prepares the permit and assigns the permit number. The permit is then signed by the Section Engineer and approved by the Engineering Manager and the Department Superintendent. The signed permit is then returned to the Safety Department.

A fireman is assigned to inspect the area, and with the Foreman concerned, assure the area is free of combustibles and is safe for a welding or burning operation. The form is then approved by the Safety Department authorizing the burning and welding on the site at the time and date specified.

A copy of the signed permit is required to be displayed at the site while the burning or welding is in progress. Should conditions warrant a fireman is assigned as firewatcher while the burning is going on.

When the job has been completed, the area is checked and it is rechecked again at about thirty minutes or so after the job, to assure that there are no burning embers or other fire.

It is important that a responsible individual, a member of supervision, be given the privilege of issuing permits required during off-hours. A copy of the permit issued on the swing and graveyard shifts should be delivered to the Safety Department on the following morning.

For detailed information, reference should be made to:

Factory Insurance Association publication "Preventing Cutting and Welding Fires"
Refer also to Part IX, Page 4 of this Guide; "Cutting and Welding Operations"
American Petroleum Institute; "Gas and Electrical Cutting and Welding"

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Section 4 PERMIT SYSTEMS

Part V

A. P. No. 4.100 "Hot Work" Electrical Permit

Effective June 1, 1962 -- Revised March 1, 1964

The established Celanese procedure for electrical work, including instructions for issuing the "Hot Work" electrical permit is explained in detail in Celanese Engineering Standard E-13.2.1 - "Safety Procedure for Electrical Work". All employees concerned, particularly those responsible for the operation, maintenance and repair of electrical circuits and apparatus should be thoroughly familiar with this Engineering Standard.

The "Hot Work" electrical permit, signed by the Plant Engineering Managers, and others, is required before any work or tests may be done on energized electrical circuits operating at or over 60 volts.

A copy of the form prescribed for use as a "Hot Work" permit is included as the preceding page of this Guide.

Work or tests on circuits operating at over 600 volts, normally is not permitted, in any Celanese plant, laboratory, warehouse, garage, or any other Celanese operation or activity. However, if it is of utmost necessity to work on a circuit in excess of 600 volts the Plant Engineering Manager may sign the "Hot Work" permit, giving special permission to work on or test circuits operating at over 600 volts.

This special permission may only be given for "Hot Work" on energized electrical circuits operating at or over 600 volts provided every practical means has been exhausted to de-energize the circuit and the work cannot be postponed till such time as the circuit can be de-energized.

For detailed information, reference should be made to:

Celanese Engineering Standard; E 13-2.1 "Safety Procedure for Electrical Work"

McGraw-Hill; "National Electric Code Handbook" by Abbott & Stetka

Celanese Safety Information Bulletin No. 20 "Procedure for Electrical Work"

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Section 4 PERMIT SYSTEMS

A. P. No. 4-100 TEMPORARY WIRING PERMIT

Part V

Effective June 1, 1962

Because temporary wiring can become "permanently" dangerous, means of control must be adopted and adhered to. It is essential that "temporary" wiring is not permitted to become "indefinite" wiring. When it is at all possible, insistence should be made that initial wiring be permanently installed in preference to any "temporary" installation. It is usually much easier to obtain permanent installation than it is to have wiring altered or changed at a later date.

If "temporary" wiring is necessary, use of the temporary wiring permit affords following up until the installation is removed or made permanent.

Another form of temporary wiring which requires consideration is the use of extension cords and cords supplying current to portable or mobile equipment such as ovens, hot plates, bench grinders and similar items. These cords are frequently placed and used permanently in one spot without a permanent electrical installation.

For detailed information, reference should be made to:

National Safety Council; "Accident Prevention Manual for Industrial Operations"

001835

Section 4 PERMIT SYSTEMS
 A. P. No. 4-100 UNATTENDED EQUIPMENT PERMIT
NIGHT PERMIT
 Effective June 1, 1962 (Revised September 1, 1964)

Part V

Permits are granted for operation of unattended equipment overnight or for longer periods of continuous operation. Authority to issue the permit should be assigned to a specific individual with a specific alternate authorized to act in his absence. It is accepted practice to have watchmen, guards or other specifically authorized individuals, shut down any equipment found operating unattended at night, on weekends, or on holidays unless the NIGHT PERMIT is displayed on the equipment.

To assure that unattended equipment is checked and is operating safely, a REQUEST FOR GUARD SERVICES form is used to instruct watchmen or guards. If watchmen or guards are expected to observe operations on their regular rounds, these people should be fully informed about any dangers which may be present. They should not be expected to add or remove chemicals or perform distillations or other operating tasks. Equipment left running should be tagged with the NIGHT PERMIT filled in to give the name and phone number of the person responsible for the equipment, specific instructions for any task to be carried out, and directions for coping with any possible emergency which can be foreseen. Obviously, when such non-technical persons are asked to help with night operations, the work should exclude the more touchy and hazardous kinds of reactions. Watchmen and guards are not familiar with experimental chemical techniques and should not be expected to function as chemists, operators or technicians.

When regular supervision is on duty, a copy of the "REQUEST FOR GUARD SERVICES" should be provided them with all instructions for the work to be done including the precautions necessary to safely handle the operation. Watchmen and guards should be instructed to always check with the supervisor on duty before shutting down any equipment.

Because certain projects may require continuous operation twenty four hours a day, seven days a week and possibly for seven or eight continuous weeks, or in some cases 365 consecutive days a year, a covering permit may be prepared for the specific operation. Whether the permit is for one night or for longer periods, the NIGHT PERMIT must indicate the effective dates and all concerned should be fully informed.

For detailed information, reference should be made to:

001837

Section 4 PERMIT SYSTEMS

A. P. No. 4-100 PERMIT TO OPEN FIRE WALLS, DIVISION WALLS OR FLOORS

Part V

Effective June 1, 1962

Each plant and laboratory should establish a standard procedure covering permission to cut openings in fire walls, division walls and floors and diked areas around flammable liquid tanks.

There should be no misunderstanding that fire walls and fire doors are provided for the purpose of localizing any fire and preventing its spread into adjacent areas. Openings in fire walls break down the plant's fire protection.

Though very infrequent, there are times when it is necessary to break a fire wall to accommodate pipe lines, duct work, operations, or material stored in close proximity to the wall. Sometimes these openings are only temporary. However, unless there is positive assurance that the openings are promptly closed, the temporary opening could remain open for a considerable time.

The fire wall cutting permit helps keep all concerned informed as to how long the fire wall would be in a state of construction and the measures taken to protect the area during the construction period. It helps assure that every precaution is taken before making any holes in any fire wall; that provision is made to close the opening during the progress of the work; and for permanently closing the opening at the finish of the work. It should be used to provide a particular reminder for the action to be taken should an emergency closing be necessary.

The Supervisor of Safety and Plant Protection should be consulted before any openings in fire walls, division walls or floors are decided. He should review the engineering drawings covering any such proposed opening prior to the work being approved.

While the work is in progress, the Plant Fire Chief should keep close check and assure that there is no slip-up.

For detailed information, reference should be made to:

001839

Section 4 PERMIT SYSTEMS**A. P. No. 4-100 SPECIAL SAFETY PERMIT****Part V****Effective June 1, 1962**

For emergency operating situations and other unusual conditions for which no specific safety permit form has been adopted, some plants use the Special Safety Permit.

For example; special safety permits should be used for moving large chlorine cylinders through plant areas; for use of carbon tetrachloride, hot tapping, excavation, use of acetone for cleaning purposes, use of fire water and for use of service water to flush process systems.

Issued by the Plant Supervisor of Safety and Plant Protection, this form helps assure that every precaution has been taken to protect personnel and plant equipment against all unnecessary accidents and fires.

For detailed information, reference should be made to:

001841

001842

Section 4 SPECIAL WORK - PROCEDURES**A. P. No. 4-100 ACCIDENT INVESTIGATION****Part VI****Effective June 1, 1962**

Every accident that occurs potentially could result in serious or fatal injury and is investigated as soon as possible, whether or not they result in personal injury. Emphasis is placed on finding the cause so as to prevent any recurrence. The immediate investigation is made by the injured's supervisor or Foreman. The investigation must be thorough and factual.

As soon as possible after he is satisfied that the injured has been properly provided for, the supervisor makes an investigation at the scene of the accident. How detailed this investigation should be depends in large part on how serious the accident or injury was, and the supervisor's knowledge and good judgement as to how the same accident could cause injury to other employees.

It is not always feasible to make a complete detailed investigation of every minor accident. However, every supervisor wants to know who in his department is getting hurt, what equipment is involved and who are the employees that are getting hurt repeatedly.

Lost time and disabling injuries require additional detailed investigation by the Supervisor of Safety and Plant Protection.

Information that is pertinent to all injury investigation necessarily includes:

- Time and place of the accident?
- Persons involved?
- What was the injured doing before the accident?
- How did the accident happen?
- Why did the accident happen?
- Were any employees injured?
- Nature and extent of injury?
- What damage resulted from the accident?
- Could this same accident occur on another machine? in another department?
in another plant?
- Recommendations to prevent any recurrence?

For detailed information, reference should be made to:

Part XII; Page 7, "Investigation of Lost Time Injury" Report
Celanese Program for Supervisory Training in Accident and Fire Prevention;
Session 16; ACCIDENT INVESTIGATION
American Standards Association - ASA - Z16.2 "Recommended Practice for
Compiling Industrial Accident Causes"
National Safety Council; "Accident Prevention Manual for Industrial Operations"

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<i>Celanese</i> CORPORATION OF AMERICA ADMINISTRATIVE PROCEDURES		Page 3
Section 4	SPECIAL WORK - PROCEDURES	Part VI
A. P. No. 4-100	<u>SAFETY INSPECTIONS</u>	
Effective	June 1, 1962	

Periodic locker inspections are important. They can be used as a basis for seasonal clean-up campaigns and serve to remove the accumulation of dirty clothes and rubbish that collects in lockers. They serve, too, as an important reminder to return forgotten tools and other equipment to the plant's tool room.

For detailed information, reference should be made to:

Page 2 - Part VI

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Section 4 SPECIAL WORK - PROCEDURES**A. P. No. 4-100 ACCIDENT INVESTIGATION****Part VI****Effective June 1, 1962**

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Celanese Program for Supervisory Training in Accident and Fire Prevention;
Session 16; ACCIDENT INVESTIGATION
American Standards Association - ASA - Z16.2 "Recommended Practice for
Compiling Industrial Accident Causes"
National Safety Council; "Accident Prevention Manual for Industrial Operations"

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Section 4 SPECIAL WORK - PROCEDURES

A.P. No. 4-100 SAFETY INSPECTIONS

Part VI

Effective June 1, 1962

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For detailed information, reference should be made to:

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<i>Celanese</i> CORPORATION OF AMERICA ADMINISTRATIVE PROCEDURES		Page 5
Section	4 SPECIAL WORK - PROCEDURES	Part VI
A. P. No.	<u>FLAMMABILITY TESTS ON DUSTS, SOLVENTS</u>	
Effective	<u>BY OUTSIDE AGENCY</u> June 1, 1962	

When Plant Management and the Plant Supervisor of Safety and Plant Protection believe a flammability test on any solvent or dust should be made by an outside agency; Bureau of Mines and the like; the Corporate Director of Safety and Plant Protection should be advised and the need for the test should be discussed.

For detailed information, reference should be made to:

001847

Celanese CORPORATION OF AMERICA ADMINISTRATIVE PROCEDURES			Page 7
Section	4	SPECIAL WORK - PROCEDURES	Part VI
A. P. No.	4-100	<u>HOT TAPPING</u>	
Effective	June 1, 1962		

"Hot Tapping" is welding onto a pressure line while in operation and is full of either gas or liquid. It means the line is not shut down while the welder "hot taps." It is particularly important in certain types of chemical operations where, provided all the known safety precautions have been taken, it is considered safer to "hot tap" than it is to bring a unit down and open it to the atmosphere.

"Hot tapping" is permitted in Celanese operations only under conditions which are considered absolutely essential to engage in hot tapping. The established procedure is detailed in Celanese Safety Information Bulletin No. 8 distributed in June 1958.

For detailed information, reference should be made to:

Part V - Page 15 "Special Safety Permit"
Celanese Safety Information Bulletin No. 8; "HOT TAPPING"
John G. Simmonds & Co., Inc.; "Safety in Petroleum Refining and Related Industries"

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Colanese CORPORATION OF AMERICA ADMINISTRATIVE PROCEDURES		Page 9
Section 4	SPECIAL WORK - PROCEDURES	Part VI
A.P. No. 4-100	<u>PERIODIC INSPECTION OF RELIEF VALVES</u>	
Effective	June 1, 1962	

Safety valves and all other pressure relieving devices such as rupture discs and vacuum valves where used should be inspected on a routine basis. The safety valve equipment should be inspected and tested as frequently as necessary and at least once a year. Other pressure relieving devices, such as rupture discs, should be given a thorough examination at the same interval; in accordance with UA-805, Paragraph (d) ASME Boiler and Pressure Vessel Code, Section VIII.

The safety valves and other protective devices, such as rupture discs and vacuum valves, where used, should be checked to see that they are in proper operating condition. This inspection in the case of valves will normally include a check on the required operation at the set pressure, a check that the proper spring is installed for the service, and that the discharge headers and outlets are free of loose corrosion products or other stoppage; in accordance with Paragraph UA 810, ASME Boiler and Pressure Vessel Code, Section VIII.

Pressure relief valves shall not be re-set to values more or less than the $\pm 10\%$ of the manufacturer's marked rating on the valve allowed by the ASME Code, Section VIII, Paragraph UG-126 (g) and UG - 133(c). If the operating conditions of the valve are changed so as to require another spring-rating for a different pressure; the relief setting shall be adjusted by the manufacturer or by an individual certified by the manufacturer of that safety valve; the valve shall be re-marked in conformance with Paragraph UG-129 of the ASME Boiler and Pressure Vessel Code, Section VIII.

It is imperative that those responsible for inspection of pressure relief mechanisms be completely familiar with those sections of Section VIII, Unfired Pressure Vessels, ASME Boiler and Pressure Vessel Code, that govern pressure relief devices; Paragraphs UG-115 through UG-134 and paragraphs UA 353 - UA 357 of Appendix (M) and assure themselves during the annual inspection that all provisions of these paragraphs are being met.

Safety and relief valves should carry a metal or plastic tag, carrying all the information required by paragraph UG-129 of Section VIII of the ASME Unfired Pressure Vessel Code. If valves are found which are not properly tagged at the time of inspection; they should be properly tagged at the time of the inspection.

For detailed information, reference should be made to:

001851

Celanese CORPORATION OF AMERICA ADMINISTRATIVE PROCEDURES		Page 11
Section 4	SPECIAL WORK - PROCEDURES	Part VI
A. P. No. 4-100	<u>ELECTRICAL RULES AND PROCEDURES</u>	
Effective	June 1, 1962	

Definite rules and procedures must be established for employee guidance in the installation, maintenance and use of electrical equipment. These established rules will obviously vary with local conditions. However, basic installation and work procedures are common to all plants and laboratories.

1. It is important that all permanent electrical installations be made in accordance with established Engineering Standards and the National Electric Code.
2. Electrical work should be done only by qualified electricians or other specifically authorized personnel.
3. The switch boxes, compensators or other starting equipment should be properly identified as to the equipment they control.
4. The use of substandard electrical materials or equipment should not be permitted.
5. Enclosures around high voltage electrical equipment should be identified with the proper voltage signs.
6. Before working on electrical equipment the plant's locking and tagging procedure should be followed. (See Pages 14 & 15 - Part VI).
7. Before starting to work on electrical circuits, voltage tests should be made to make certain the circuits are not energized. All voltage tests on systems at 2300V or higher should be made by means of a potential transformer and voltmeter. An approved voltage tester may be used on circuits at 440 or lower voltages.
8. Following major maintenance or construction work on electrical circuits they should be tested for grounds by an approved method before the circuits are energized.

(Continued on Page 12 - Part VI)

For detailed information, reference should be made to:

Factory Mutual Bulletin No. 15.10 - An Electrical Maintenance Schedule
 No. 15.60 - Lightning Protection for Electrical Equipment
 National Fire Protection Association - National Fire Codes V - Electrical
 Factory Insurance Association - Selecting and Installing Electrical Equipment
 in Textile Mills
 Bureau of Ships, Navy Department; Electric Shock, Its Causes and Its Prevention
 Bureau of Labor Standards; U.S. Department of Labor; Control of Electrical
 Shock Hazards
 Celanese Engineering Standard E 13-2.1 "Safety Procedure for Electrical Work"

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Section 4 SPECIAL WORK - PROCEDURES
A. P. No. 4-100 ELECTRICAL RULES AND PROCEDURES
Effective June 1, 1962

Part VI

19. Use of hand lights and open incandescent lights are not to be permitted in hazardous areas. Rebulbing in this area should be done with circuit open.
20. Grounding of electrical equipment, flammable liquid storage tanks, tank cars, piping, building steel and other facilities handling hazardous explosives and/or flammable material, should conform with Engineering Standards and the standards of the National Fire Protection Association.
21. Flexible ground wires for dissipation of static electricity should be properly grounded.
22. Extension cords and portable electrical equipment should be inspected regularly by the plant Electrical Department to insure that they are in good safe condition.

Inspection and maintenance work on electrical equipment must be performed only by qualified and authorized personnel. Such employees must receive proper instruction in accident prevention and first aid procedures.

Employees engaged in electrical work should be fully informed on the hazards involved. These instructions should include the precautions necessary for personal contact with and working with electricity and precautions necessary to avoid fires.

For detailed information, reference should be made to:

Page 11 - Part VI

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Celanese CORPORATION OF AMERICA ADMINISTRATIVE PROCEDURES			Page 15
Section	4	SPECIAL WORK - PROCEDURES	Part VI
A. P. No.	4-100	<u>LOCKING AND TAGGING OF EQUIPMENT FOR INSPECTION AND REPAIR</u>	
Effective	June 1, 1962		

When a mechanic is working on the equipment in such a way as to expose himself to any of the hazards mentioned above, he should be certain to place his lock on one of the main valves or switches controlling the equipment. The Foreman might have a master key or a duplicate key, but aside from that, it is not desirable to permit anyone to control the lock.

It is good practice for each repairman working on a particular job to have a separate lock. As soon as he is finished with this work, he should remove his lock. In case of shift change, he might remove his lock when leaving and his relief could then put his lock in place before he commences work.

When the Plant Safety and Fire Inspector issues the permit to enter a vessel equipped with agitators or stirrers, he should also lock the breaker and remove it only after the permit is removed. The Plant Safety and Fire Inspector's lock should be the last lock removed.

When warning tags are used it is wise for foremen to instruct all employees to observe such warnings.

For detailed information, reference should be made to:

Page 14 - Part VI

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Section 4 SPECIAL WORK - PROCEDURES**A. P. No. 4-100 SAFETY HAZARDS REPORT****Part VI****Effective June 1, 1962**

Several plants have adopted the Safety Hazard Report and find it useful. It facilitates employees' reporting conditions believed to be hazardous and their requesting inspection of equipment they believe to be unsafe.

Any employee discovering an unsafe or hazardous condition reports it to his Shift Supervisor. Requesting the Safety Hazards Report form from the Supervisor, he completes the form in duplicate. The original copy is given to the Shift Supervisor and the duplicate copy is forwarded to the Plant Supervisor of Safety and Plant Protection.

The Shift Supervisor investigates all employee reports of unsafe or hazardous conditions. If warranted, the Shift Supervisor takes the necessary action to correct the condition, advising the employee of his action.

The Supervisor of Safety and Plant Protection investigates and follows up on all Safety Hazard Reports submitted.

When practicable, the employee reporting the unsafe condition usually accompanies the Shift Supervisor when the investigation or inspection is made.

For detailed information, reference should be made to:

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Section 4 SPECIAL WORK - PROCEDURES**A. P. No. 4-100 OUTSIDE CONTRACTORS****Effective June 1, 1962****Part VI**

The outside contractor must abide by all the accident and fire prevention requirements of the plant or laboratory. A copy of Celriver Plant's safety instructions for outside contractors is included as an exhibit on the following pages of this Guide.

Some plants arrange to make the medical dispensary, or First Aid facilities and treatment available to contractor's employees and maintain a separate record of any such treatments.

Another practice at some of the plants is to have contractor's employees attend the regular plant safety meetings as well as holding separate safety meetings for contractor's employees.

Should any contractor's employee sustain an injury when working on any Celanese project, or on Celanese property, Accident Report Form Gen-887 should be completed and forwarded to the distribution specified on this Insurance Department form.

At new plant sites, the Project Engineer will be responsible for requesting the general contractor and any sub-contractor, to furnish the New York Insurance Department a copy of their Employee's First Report of Injury form, which must be prepared by the contractor at the time of any injury to a contractor's employee.

For detailed information, reference should be made to:

Part XII - Page 31; Accident Report Form Gen-887

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EXHIBIT

- E. Celriver's tank or confined space entry permit system must be followed.
- F. All areas in which overhead work is being performed must be roped off, or otherwise barricaded, to prevent usage of the area.
- G. Excavations.
 - 1. The contractor shall secure an excavation permit from the engineer-in-charge before starting excavation in any areas.
 - 2. All holes through floors, open excavations, or other conditions which may result in falls or serious injury must be well barricaded.
 - 3. Excavations in excess of six feet shall be shored. Excavations of lesser depths shall be shored if condition of soil requires extra precaution. This decision is up to Calañese Project and Safety Engineers.
- H. Scrap material and debris shall be removed from the work area daily.
- I. Areas around fire extinguishers, fire hydrants, hose boxes and first aid equipment must be readily accessible at all times and kept free of debris or equipment.
- J. Streets and passageways must be kept open for the movement of the plant ambulance and fire truck.
- K. Approved respirators, or other respiratory equipment, should be used when deemed necessary.
- L. Flammable liquids, such as gasoline and kerosene, must be kept in safety cans.
- M. All gasoline-powered equipment must be refueled outdoors.
- N. All vehicles must be parked as far from plant buildings as is practical.
- O. Hoisting and lifting equipment, wire rope, cable and manila rope must be in excellent condition before using.
- P. Welding equipment must be in excellent condition:
 - 1. Oxy-acetylene cylinders should be used from the regular two-wheel cart.
 - 2. The ground wire for arc welding must be attached to the work being welded.
- Q. Trucks, cranes, bulldozers, and all other construction machinery must be in safe operating condition before entering the plant.

3. SMOKING

Smoking is prohibited in all locations except in certain designated smoking areas that are located strategically throughout the plant.

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EXHIBIT

In conclusion, the contractor shall comply with and require his employees to comply with all plant working and safety rules and shall perform the work in a safe manner. He shall keep the premises free of safety hazards and shall comply with all applicable rules and building codes.

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Section 4 SPECIAL WORK AND PROCEDURES**A. P. No. 4-100 TOXICITY OF MATERIALS****Part VI****Effective June 1, 1962**

Contemplated changes in any process, substance, equipment or plant layout could effect the task of preventing illness or accidents. Careful study of the hazard potential of any new or revised process is essential if the toxic effects of the contemplated revision are to be held to the minimum.

For detailed information, reference should be made to:

American Standards Association; Safety Data Sheets; Chemical Series

National Safety Council; "Table of Chemical Hazards";

Chapter 42 of the Accident Prevention Manual for
Industrial Operations (1959)

American Industrial Hygiene Association; Hygienic Guide Series

American Petroleum Institute; Toxicological Reviews

Chemical Publishing Co.; "Toxicity of Industrial Organic Solvents; (Browning)

Chlorine Institute; The Chlorine Manual

Williams and Wilkins Company; Industrial Toxicology; (Fairhall)

Interscience Publishers; Industrial Hygiene and Toxicology(Patty)

Analytical Chemistry of Industrial Poisons, Hazards and
Solvents (Jacobs)

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Section 4 SPECIAL WORK - PROCEDURES**A. P. No. 4-100 HAROLD BLANCHE SAFETY AWARD****Effective June 1, 1962****Part VI**

Because the health and safety of our employees is of paramount importance, the Corporation, from its very beginning, has always made strenuous efforts to establish the best operating conditions and an alert attitude to the dangers of neglect and carelessness.

Mr. Blancke, on December 27, 1951, announced the initiation of the Celanese Annual Inter-Plant Safety Contest. The objective of the contest is to protect the health and well-being of our people and to stimulate plant and employee cooperation in preventing unnecessary accidents and fires.

At the conclusion of each contest year, Mr. Blancke presents the Harold Blancke Safety Award to the plant or laboratory, which, in the opinion of the Contest Board of Judges, has accomplished the most outstanding achievement in accident and fire prevention during the contest year.

The rules for the contest, including the basis for earning the President's Certificate of Commendation and the Harold Blancke Safety Award are included in the next pages of this Guide.

For detailed information, reference should be made to:

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**CELANESE CORPORATION
ANNUAL SAFETY CONTEST
(Revised January 1, 1967)**

Rule 1: ELIGIBILITY

- A. All-plants of Celanese Corporation, Fiber Industries, Inc. and Celanese Coatings Company located within the United States shall be participants in the Annual Safety Contest. The word 'plant' is used to include all laboratories, Celanese Trucking Division and Newark Chemical Bulk Storage Terminal.

Rule 2: CONTEST PERIOD

- A. The contest will be an annual inter-plant competition.
- B. Each year, the annual period for the contest will conform to the Corporation's established statistical period.

Rule 3: AWARDS

A. CHAIRMAN'S CERTIFICATE OF COMMENDATION

1. Awarded to the winning plant in each contest group. If two or more plants in any contest group are tied for first place, the Chairman's Certificate of Commendation will be presented to each winning plant or laboratory.

B. HAROLD BLANCKE SAFETY AWARD

1. An appropriate plaque, suitably engraved, will be awarded to the eligible plant, which in the opinion of the Safety Award Committee, has accomplished the most outstanding performance in accident and fire prevention during the contest year.
2. The identity of the winning plant and the year in which the contest was held will be engraved on the face of the plaque.
3. Recipients will retain permanent possession of this award.
4. Plants winning the Harold Blancke Safety Award in any given contest year, are eligible to again win the award for the succeeding contest year, or any following contest year.

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Rule 4: CONTEST GROUP DIVISIONS

A. Based on man-hours worked, contest groups are established as follows:

1. Contest Group A:

Ancelle, Celco, Celriver, Rome, F.I.I. Shelby, F.I.I. Salisbury, F.I.I. Greenville.

2. Contest Group B:

Chemcel, Pampa, Houston, Bay City.

3. Contest Group C:

Newark Plastics, Belvidere, Columbus, Greer.

4. Contest Group D:

Bridgewater, Trucking Division, Princeton, Newark Terminal.

5. Contest Group E:

Newark (081), Louisville (086), Los Angeles, Riverside, Detroit, Malden, Houston (080), San Francisco, Louisville (087).

6. Contest Group F:

Fibers Technical Center, Summit, Corpus Christi, Clark.

B. REVISIONS IN GROUP ASSIGNMENTS

1. At the conclusion of each contest year the group assignments will be reviewed. There will be no changes in group assignments during the contest year.

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- (b) Eligible plants are required to submit a completed copy of the Summary of Safety Performance, form GEN-1926 (7-63). Photographs, drawings or other substantiating materials may accompany the resume. At the close of each Contest Year, this summary is to be submitted to the corporation's Director of Safety and Plant Protection, Charlotte, North Carolina.

D. BASIS OF AWARD

- 1. Completed copies of the Summary of Safety Performance forms will be reviewed and evaluated by the Safety Award Committee.
- 2. In addition to evaluating the written summaries, the effectiveness of the eligible plants' participation in the corporation's safety program will be appraised, based on the following criteria. For this appraisal, the Director of Safety and Plant Protection will serve the Safety Award Committee in an advisory capacity.

3. CRITERIA

- (a) That Plant Management Safety Committee is organized and functions as outlined in Part I, Page 3-8, Corporate AP 4-100, Celanese Accident and Fire Prevention Reference Guide and Safety Organization. A copy of the minutes of the meetings of the Plant Management Safety Committee is forwarded to the Director of Safety and Plant Protection.
- (b) That voluntary contributions, forwarded to the Director of Safety and Plant Protection, are accepted and published in the Safety Progress Report or are distributed to all plants in the current series of Safety Information Bulletins.
- (c) That reports of investigations are submitted to the Director of Safety and Plant Protection covering 'near-miss' type of accidents. (A 'near-miss' type of accident is one that might have resulted in either a serious injury, physical property damage or both).

4. FIRE EXPERIENCE

- (a) If, in the opinion of the Safety Award Committee, a plant's fire experience or loss is considered to be excessive, it is within the jurisdiction of the Safety Award Committee to rule that plant ineligible for an award.

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Section 4 SPECIAL WORK - PROCEDURES
A. P. No. 4-100 "TOTAL INJURY CONTROL PROGRAM"
Effective July 1, 1964

PART VI

1. GENERAL

Because disabling injuries alone do not provide a sufficiently broad base for properly evaluating the effectiveness of our accident prevention work, beginning July 5, 1964, this Celanese "Total Injury Control Program" goes into effect and supplements the existing injury reporting system.

2. PURPOSE

This "Total Injury Control Program" will provide:

- a) A more effective yardstick for measuring improvement in accident prevention
- b) A more equitable basis for comparison of safety performance
- c) Realistic safety performance improvement targets, as an integral part of the corporation's five year operational planning
- d) A self-regulating challenge for self-improvement in preventing accidents and injuries.

Injury rates established through this "Total Injury Control Program" are for use only within the corporation. Frequency rates reported to authorized outside agencies will continue to be based only on disabling injury experience.

3. SCOPE

"Total Injury Control" as defined below, includes all types of industrial injuries, whether or not any lost time or permanent injury is involved.

- a) All disabling injuries
- b) All non-disabling injuries, with the following exception:

For detailed information, reference should be made to:

This "Total Injury Control Program" is in addition to, and supplements the reporting and recording system explained in Part XII - REPORTS AND RECORDS.

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Section 4 SPECIAL WORK - PROCEDURES**A. P. No. 4-100 "TOTAL INJURY CONTROL PROGRAM"**

PART VI

Effective July 1, 1964

- 1) Eye cases resulting from wind blown objects (for example dust in the eye) are not included.

4. PROCEDURE

Each plant and laboratory will:

- a) Determine its accurate "Total Injury Frequency Rate" for the five year period January 1959 through December 1963.
 - 1) Plants in operation less than five years will establish the rate for the full period of operation, up to and including December 1963.
 - 2) Total Injury Frequency Rate is the total number of injuries multiplied by one million and divided by total man hours worked.
- b) Forecast the target for improvement in accident prevention experience for the five year period 1964 through 1968.
 - 1) Improvement forecast is scaled at 5% improvement per year and a minimum of 25% for the five year period.
- c) Prepare the "Total Injury Control Chart" as illustrated in Exhibit A.
 - 1) Details of chart preparation are outlined in Paragraph 5.
- d) At the conclusion of each statistical period, a copy of the up-to-date chart is to be forwarded to the corporate Director of Safety and Plant Protection.
 - 1) The first chart should be forwarded so as to reach the corporate Director of Safety and Plant Protection not later than July 25, 1964. Charts should always arrive at Charlotte not later than the last day of each statistical period.

For detailed information, reference should be made to:

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Colson CORPORATION OF AMERICA ADMINISTRATIVE PROCEDURES

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Section 4 SPECIAL WORK - PROCEDURES**A. P. No.** 4-100 "TOTAL INJURY CONTROL PROGRAM"**Effective** July 1, 1964

PART VI

- 2) The "X" entry may begin with July 1964, although there is no objection to indicating the progressing experience beginning with January of 1964.
- e) Each month, the Plant Management Accident and Fire Prevention Committee will review this "Total Injury Control Chart".
 - 1) Particular attention will be directed to plants and laboratories that report continued and outstanding reduction in the Total Injury Control Frequency Rate. The reasons for continued improvement may prove helpful to the other plants and laboratories.
 - 2) An explanation will be sought from plants or laboratories that repeatedly fail to meet the objective.

5. PREPARING THE CHART

- a) Form Gen. 2022 is the standard form to be used. (Exhibit B)
- b) On the left side of the chart indicate the five years 1959, 1960, 1961, 1962, and 1963 as shown on Exhibit A.
- c) Fill in the Frequency Rate values at tick marks on the left and right sides of the chart.
- d) Fill in the legend or key on both the right and left sides as shown in the exhibit.
- e) Plot the "Total Injury Frequency Rate" for the five year period 1959 through 1963. Use a solid line as shown in green on Exhibit A.
- f) Plot the five year improvement objective as shown in the solid red line on Exhibit A. Instead of using the red line as indicated in the exhibit, a broken line should be used to indicate this objective target line.

For detailed information, reference should be made to:

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- 1) The improvement objective target line indicates the projected Total Injury Control Frequency Rate that each plant will strive to attain by December 1968.
- g) On the right side of the chart, use a broken line to indicate the 5% improvement objective for the immediate twelve months of 1964.
- h) Each month, when the "Total Injury Control Frequency Rate" has been established, mark an "X" at the appropriate location on the right side of the chart.
 - 1) If the Frequency Rate is below the objective, the "X", placed in the proper location on the chart, will reflect the improvement. If the experience is higher, it will also be indicated on the chart.
 - 2) The "Total Injury Control Frequency Rate" is based on the cumulative experience for the period January through the month reported.
- i) In preparing Exhibit A, the "Total Injury Frequency Rate", for illustration purposes, was set at 300 for the period 1959 through 1963. (Green Line)
 - 1) The five year improvement forecast was set at 225 or a reduction of 25% of the total experience. (Red Line)
 - 2) The forecast line for the twelve months in 1964 begins at 300 in January and is aimed at 285 in December; a 5% reduction over the year. (Broken Line)
- j) Exhibit "C" illustrates the steps to be taken at the beginning of the year 1965.
 - 1) The year 1959 is deleted and the year 1964 is added.

For detailed information, reference should be made to:

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just as serious, possibly more serious, than injuries that do produce disabilities. Often the severity of the injuries, once the accident occurs, is minor or grievous, depending upon luck and the grace of God.

There is no solid ground for assuming that the prevention of accidents is under control when there is a decrease in the number of disabling injuries, if at the same time there is an increase in the total number of all injuries. This is particularly significant when long periods occur without any disabling injuries, although, during those same periods, there may be numerous injuries which are classified as "minor" or "reportable" but not "chargeable" injuries.

Because the disabling injury frequency rates achieved by the plants and laboratories of Celanese Corporation of America are inadequate to effectively gauge the accident prevention progress, the "Total Injury Control Program" has been adopted.

Note: The initial supply of blank form No. Gen 2022 will be forwarded to each plant and laboratory direct from the print shop at Amcelle Plant.

Requests for additional copies of this form should be made direct to: Celanese Fibers Company, P. O. Box 444, Cumberland, Maryland, Attention- Print Shop.

For detailed information, reference should be made to:

001885

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Section 4	SPECIAL WORK - PROCEDURES	Part VI
A. P. No. 4-100	"JOB SAFETY ANALYSIS" PROGRAM	
Effective	August 1, 1964	

GENERAL

Job Safety Analysis forms the basis for planning safe work practices. This program is recommended to all plants and laboratories because specific safety requirements and procedures are tremendously important from a combined safety and economic viewpoint. It is the most direct route to solving safety problems and getting down to the very core of accident and injury prevention.

PURPOSE

This program is designed to offer an organized effort to:

- a) Spot hazards and unsafe practices in a given job before an accident happens.
- b) Develop specific safety requirements for machinery, equipment, process and/or operation.
- c) Establish specific safety requirements for the employee.
- d) Determine equipment and tools needed for safety.
- e) Provide specific information for safety training and instruction of employees.
- f) Provide specific guidelines for supervisory enforcement of safe job procedures.

Before a man is assigned a given job, the work should be analyzed in terms of the demands placed upon his physical and mental abilities. No supervisor should assign a man to a given task without considering the possible damage which might result from unsafe operating conditions, and assure that all necessary safeguards are provided and all necessary precautions are taken.

For detailed information, reference should be made to:
Celanese Program for Supervisory Training in Accident and Fire Prevention;
Session No. 6. "Job Safety Analysis".

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Section 4 SPECIAL WORK - PROCEDURES
A.P. No. 4-100 "JOB SAFETY ANALYSIS" PROGRAM
Effective August 1, 1964

PART VI

PROCEDURE

The five basic steps to "Job Safety Analysis" are:

1) **Select the Job to be Analyzed**

Departmental management selects the job to be analyzed.

The selection of, and the order in which jobs are analyzed, will greatly influence the benefits from the program.

Some jobs are definitely more hazardous than others and have a worse accident history. Those jobs that are the most hazardous should have priority.

In selecting the jobs to analyze, and in establishing the order of analysis, the following factors should be considered:

a) **Frequency of Past Accidents**

Any job that has repeatedly produced accidents should be analyzed. The greater the number of accidents associated with a job, the greater is its priority claim for a job safety analysis.

b) **Frequency of Disabling Injuries**

Jobs that produce a disabling injury are a "must" for a job safety analysis. A disabling injury, of itself, proves that past action to prevent recurrence has not been effective.

c) **Severity Potential**

Some jobs may not have a history of accidents, but may, at the same time, have a potential for severe injury and/or

For detailed information, reference should be made to:

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Section 4 SPECIAL WORK - PROCEDURES

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property damage. The opinion of supervision that a job has this potential provides sufficient justification for a job safety analysis.

d) The New Job

Changes in processes, equipment and machinery create new jobs -- or change jobs -- from time to time. Such new jobs have no history of accidents and their accident potential may not be fully appreciated. Job Safety Analysis should not wait until there are accidents or even near-misses. The job safety analysis will reveal the accident potential of the job.

2) Breaking Down The Job

The first step in making a job safety analysis is to make a written breakdown or description of the job. The supervisor should break down the job being analyzed before seeking the hazards. To simplify preparation of the analysis, Form No. Gen-2047, "Job Safety Analysis Breakdown Sheet" is provided.

Dividing the operation into its individual elements, the supervisor should list the basic steps of the job in the first column under "STEPS." This job-step breakdown should describe what is done and in what sequence.

It is not necessary to make the job-step breakdown too detailed, but important basic steps might be omitted if it is too general.

3) Identify The Hazards

Each job-step is to be studied individually to determine the hazards involved. Nothing should be taken for granted. Every detail of the job should be taken for granted. Every detail of the job should be questioned for the possibility of causing accidents.

For detailed information, reference should be made to:

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Section 4 SPECIAL WORK - PROCEDURES

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5) The Completed Job Safety Analysis

When each Job Safety Analysis has been completed the supervisor should discuss the contents with his employees concerned so that they know how the job is to be done in the future. The procedure established should be tested. When satisfied that the analysis is adequate and that the precautions taken and safety instructions prescribed are fully satisfactory, the analysis can be considered completed. It is from this point on that the men are expected to follow the safe procedures established by the job safety analysis.

The completed job safety analysis should be typewritten and a copy forwarded to the Plant Supervisor of Safety and Plant Protection. The original should be retained in the department having jurisdiction over the job.

CONCLUSION

Having completed the job safety analysis of the given job, the supervisor now has the specific knowledge he needs to:

- a) Know the possible damage which might result from operating conditions.
- b) Know the necessary safeguards that must be provided.
- c) Assure that every precaution has been taken.
- d) Plan safe working practices.
- e) Instruct employees.
- f) Follow up instructions and be sure safe practices are followed.
- g) Improve efficient operation of his department.

For detailed information, reference should be made to:

001892

PART VII - FIRE PREVENTION
AND PROTECTION

001894

Section 4 FIRE PREVENTION AND PROTECTION

A.P. No. 4-100 GENERAL

Part VII

Effective June 1, 1962

It should be understood that the complete steps to be taken for the prevention of fires are extensive. Reference to the codes and standards of the National Fire Protection Association should be made in order to maintain the utmost in fire safety at new and existing installations.

Each plant and/or laboratory should establish procedures and regulations that will assure that sufficient fire-extinguishing equipment and personnel organized and trained to use the equipment correctly shall be present at all hours.

In order to reduce the fire hazard there are two considerations (1) fire prevention and (2) fire protection.

Fire Prevention demands that each plant and/or laboratory building, equipment, operations and procedures are designed, constructed and maintained so that they are as free as possible from causes of, or aids to combustion.

Fire Protection demands, in addition to organized and trained personnel, that each plant and/or laboratory assure the fullest development and use of designs and methods for detecting and controlling fires so as to assure prompt discovery and extinguishment should a fire occur.

Fire Protection equipment embraces water pumping and storage facilities including elevated tanks and reservoirs, distribution piping, mains, pumps, hydrants, permanent foam, fog or spray systems, including pumping equipment and drainage facilities, hose, foam generators, monitor nozzles, mobile pumping units and fire trucks, extinguishers either of hand or cart types, stock of foam powder or solutions and all other equipment of a similar character including the buildings in which it may be exclusively housed.

In situations where fire protection is needed, but an automatic extinguishing system is not feasible, or cannot be justified, installation of a fire detection system should be considered. Such systems are not a substitute for fire extinguishing systems and should be installed only after consultation with the Director of Safety and Plant Protection.

(Continued on Page 2- Part VII)

For detailed information, reference should be made to:

National Safety Council; "Handbook for Industrial Operations"
National Safety Council; "Safe Practices" Pamphlet No. 19, 31, 36
American Standards Association; Series Z12; Safety Codes for Preventing Dust Explosions
Bureau of Mines; Bulletin 503, Limits of Flammability of Gases and Vapors
Bureau of Mines; "Safety with Solvents"
Factory Insurance Association; "Combustion Safeguards for Ovens, Dryers and Furnaces"
Factory Mutual; "Approved Equipment for Industrial Fire Protection"
Factory Mutual; "Static Electricity"
Institute of Makers of Explosives; "Safety in Handling and Use of Explosives"
Additional references: Page 2 - Part VII - this reference guide.

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Section: 4 FIRE PREVENTION AND PROTECTION

A. P. No. 4-100 FIRE PROTECTION ORGANIZATION

Part VI.

Effective June 1, 1962 (Revised September 1, 1964)

The following fire fighting and fire protection organization can be adapted to meet the needs of all plants or laboratories and should give maximum protection with a minimum amount of expense.

A Fire Chief should be assigned. In larger plants this is a full-time assignment. Qualifications should include training and experience in fire prevention and protection; ability to organize; and very important-- a competent and capable fire prevention and fire fighting instructor.

The Plant Engineer is suggested for this assignment in the smaller plants or laboratories.

Because Fire Protection demands competent and experienced leadership twenty four hours a day, an Assistant Fire Chief, one for each shift, is required. The Assistant Fire Chief assignment demands the same qualifications indicated for the Fire Chief.

Fire Brigade:

A centrally organized Plant Fire Brigade is required for each plant. The Fire Brigade should be under the direction of the Plant Fire Chief or his assistant.

Made up of volunteers from regular plant employees from all departments; thoroughly trained in using the plant's fire fighting equipment, they should assemble quickly and take over any fire, particularly if it threatens to go beyond the control of the Departmental Hand Extinguisher and Standpipe Company unit.

Members appointed by the Plant Manager, on approval of the Fire Chief, should be selected in such a way that no matter what time of day or night a fire may occur, the Fire Brigade will always be at full strength.

All shift supervisors, rotating on shift, should be thoroughly trained as Fire Brigade members. They can lend valuable assistance on holidays, weekends, and at night when normally a small crew is working.

For detailed information, reference should be made to:

National Fire Protection Association; "Guide for Organization of Fire Safety in Modern Industrial Establishments and Suggestions for Organization, Drilling and Equipment of Private Fire Brigades"

National Safety Council; "Safe Practices" Pamphlet Nos. 19 and 36

Factory Mutual Insurance Companies; "Organizing Your Plant for Fire Safety"

F. W. Dodge Corp. 1958; "Plant Engineering Practice;" Pages 114-117; 126-128

National Fire Protection Association; "Standard No. 27; Fire Brigades"

National Fire Protection Association; "Handbook on Fire Protection"

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Section 4 FIRE PREVENTION AND PROTECTION

A. P. No. 4-100 FIRE PROTECTION ORGANIZATION

Part VII

Effective June 1, 1962 (Revised September 1, 1964)

Electricians, engineers, mechanics, pump operators, pipe-fitters, welders, truck drivers, watchmen, Safety and Fire Inspectors, all have special skills which make them valuable members of a Plant Fire Brigade.

Every safety and fire inspector, watchman, or guard should be trained in preventing and fighting fires.

Training of Fire Fighting Organizations:

Training of all members of the Departmental units and the Fire Brigade should be conducted by the Fire Chief and Assistant Fire Chiefs.

Inauguration of one hour each week for training the Fire Brigade, after the organization has been established, is recommended.

Training time should be allocated for the Departmental units.

Continuous programs, instructing every employee on proper procedures to avoid fire in his work, and including general fire prevention instructions, should be established by the fire organization.

All employees should be trained to recognize the proper fire extinguisher and know how to use it properly.

For detailed information, reference should be made to:

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Colanese CORPORATION OF AMERICA ADMINISTRATIVE PROCEDURES

Part VII

Section 4 FIRE PREVENTION AND PROTECTION
 A. P. No. 4-100 FIRE PROTECTION ORGANIZATION
 Effective June 1, 1962

First Aid fire-fighting equipment, used promptly, by properly trained workmen, is usually adequate for extinguishing most fires.

Fire Brigade:

Beyond the Departmental Hand Extinguisher and Standpipe Company, each plant requires a centrally organized Fire Brigade. The Fire Brigade should be under the direction of the Plant Fire Chief or his assistant.

Made up of volunteers from regular plant employees from all departments; thoroughly trained in using the plant's fire fighting equipment, they should assemble quickly and take over any fire, particularly if it threatens to go beyond the control of the Departmental Hand Extinguisher and Standpipe Company unit.

Members appointed by the Plant Manager, on approval of the Fire Chief, should be selected in such a way that no matter what time of day or night a fire may occur, the Fire Brigade will always be at full strength.

All shift foremen, rotating on shift, should be thoroughly trained as Fire Brigade members. They can lend valuable assistance on holidays, weekends, and at night when normally a small crew is working.

Electricians, engineers, mechanics, pump operators, pipe-fitters, welders, truck drivers, watchmen, Safety and Fire Inspectors, all have special skills which make them valuable members of a Plant Fire Brigade.

Every watchman or guard should be a fireman; trained in preventing and fighting fires.

Training of Fire Fighting Organizations:

Training of all members of the Departmental units and the Fire Brigade should be conducted by the Fire Chief and Assistant Fire Chiefs.

(Continued on Page 7 -Part VII)

For detailed information, reference should be made to:

Page 3 - Part VII

001902

Section

A. P. No.

Effective

Part VII

RESERVED

For detailed information, reference should be made to:

001903

Section 4 FIRE PREVENTION AND PROTECTION

A. P. No. 4-100 ANALYSIS OF CAUSES OF INDUSTRIAL FIRES

Part VII

Effective June 1, 1962

Hot Surfaces

Fires result from combustibles exposed to heat from boilers, furnaces, hot ducts, flues, electric lamps or from hot materials being processed. Provide ample clearances, insulation, and ventilation. Check when leaving heated apparatus unattended.

Spontaneous Ignition

Usually caused by oily waste, rubbish, solvent, soaked rags, deposits in ducts and flues, storage of low-grade materials and industrial wastes. Remedy is good housekeeping and standard metal containers for combustible waste and rubbish. Remove waste frequently, clean ducts and flues frequently, and isolate storages subject to spontaneous heating and combustion.

Combustion Sparks

From rubbish burning, boiler stacks, furnace fire boxes and process equipment. Provide well designed and well constructed combustion chambers tightly enclosed with spark arrestors on stacks as needed.

Burner Flames

Gas and oil burners, misuse of gasoline or similar torches. Keep burners properly adjusted and surroundings clean. Avoid use of open flame torches near combustibles.

Cutting and Welding

Cutting and Welding torches (particularly sparks and molten globules). Use burning and welding permit and all recognized precautions for cutting and welding. (See Page 5 - Part V of this Reference Guide).

Overheated Materials

Caused by abnormal process temperatures involving such things as heated flammable liquids and materials in dryers. Careful supervision and competent operators supplemented by well maintained automatic temperature controls are required.

Static Electricity - Sparks

Dangerous where flammable vapors, dusts or explosives may exist. Controlled by grounding, static eliminators, and humidification.

(Continued on Page 10 - Part VII)

For detailed information, reference should be made to:

001905

PART VIII - FIRE CONTROL AND
EXTINGUISHMENT

001907

Calumet CORPORATION OF AMERICA ADMINISTRATIVE PROCEDURES

Page 1

Section 4 FIRE CONTROL AND EXTINGUISHMENT

A. P. No. 4-100 SPRINKLER SYSTEMS

Part VIII

Effective June 1, 1962

Automatic sprinklers have become by far the most widely used, reliable and effective means of fire protection. They eliminate human delays and mistakes in attacking a fire. Serious fires seldom occur in properties completely protected with properly maintained automatic sprinkler systems. For complete information on this protection, reference should be made to the Standards of the National Fire Protection Association's pamphlet No. 13 "Installation of Sprinkler Systems."

Factory Insurance Association must be notified in advance if a sprinkler system is cut off, when operation of any sprinkler control valve is contemplated, or if there is any impairment of fire protection.

For detailed information, reference should be made to:

American Petroleum Institute; Fire Protection in Refineries
American Petroleum Institute; Recommended Practices for Refinery Inspections; Part III
American Petroleum Institute; "Fire Protection Equipment"
Factory Mutual; Handbook of Industrial Loss Prevention
Factory Mutual; Approved Equipment for Industrial Fire Protection
Factory Mutual; Maintenance of Dry Pipe Systems; (Loss Prevention Bulletin No. 21.72)

001908

Section 4 FIRE CONTROL AND EXTINGUISHMENT**A. P. No. 4-100 HYDRANTS, HOSE HOUSES AND BOXES****Part VIII****Effective June 1, 1962**

6. It is considered best practice to provide a valve on both hydrant outlets so hose can be changed or added to one line while the other line is kept in service.

For detailed information, reference should be made to:
Part VIII - Page 2

001910

Section 4 FIRE CONTROL AND EXTINGUISHMENT**A. P. No. 4-100 CONTROL VALVES****Part VII****Effective June 1, 1962**

Where curb-box valves are not normally sealed, the valve should be tried with the tee handle wrench by turning one-half turn in the closing direction and then turning to the wide open position to get the "spring of the rod" and then turning in the closing direction one-fourth turn so it will not be jammed open.

Access to all valves should be kept clear, including all valves in pits. Valve pits should be kept free from water and be properly protected against damage by vehicles.

For detailed information, reference should be made to:

Part VIII - Page 4

001912

Section 4 FIRE CONTROL AND EXTINGUISHMENT**A. P. No. 4-100 FIRE PUMPS****Part VIII****Effective June 1, 1962**

The pump room should be checked at least weekly to be sure it is clean, accessible and heated during cold weather. If suction is taken from an open-air water basin, or a natural water supply, such as a river, the suction pipe, intake, foot valve and screens should be kept free from ice or other obstructions. Sump pumps and ventilating exhausters in the pump room should be checked.

During freezing weather it may be necessary to check the room temperature several times a day.

Electric motor driven centrifugal pumps should be checked each week for excessive gland leakage and to determine if the bearings on the pump and motor remain cool. The water pressure developed should be noted on the F.I.A. Plant Fire Prevention Inspection form. (See Page 15 - Part VIII).

Gasoline or diesel engine driven pumps should be checked weekly. The engine should be warmed to temperature and then the pump should be run at rated speed for not less than ten minutes, or if needed, for a longer period. The engine should then be cooled at 1000 r.p.m. for five to ten minutes. Check should be made for excessive gland leakage and if the bearings on the pump remain cool. After running the engine should idle for one minute before shutting off.

The storage battery should be checked to make sure that it is fully charged. The battery water, trickle charger, fuel tank and oil level in the crank case should be checked. The temperature of the engine cooling system should be checked to make sure it doesn't overheat. The water pressure with the pump running should be recorded on the F.I.A. Plant Fire Prevention Inspection Form. (Page 15 - Part VIII).

On steam turbine driven (centrifugal) pump, a weekly check should be made that the required steam pressure is available at the throttle valve. The pump should be run for fifteen minutes at the rated speed and checked for excessive gland leakage and if the bearings remain cool. Pressure of the steam supply and exhaust should be noted and the water discharge pressure should be entered on the F.I.A. Plant Fire Prevention Inspection form. (Page 15 - Part VIII)

(Continued on Page 8 - Part VIII)

For detailed information, reference should be made to:

National Fire Protection Association; Standard No. 191, "Portable Pump Units"
The Spectator; "Fire Prevention and Protection Fundamentals;" G. E. Stecker
National Fire Protection Association Handbook - Crosby-Fiske-Forster
Factory Mutual; "Handbook of Industrial Loss Prevention"

001914

Section 4 FIRE CONTROL AND EXTINGUISHMENT**A. P. No. 4-100 FIRE HOSE****Part VIII****Effective June 1, 1962**

Fire hose is the most essential equipment for fire protection. There are standard specifications for fire hose which can be obtained from Underwriters' Laboratories. When well-cared for and not injured at fires, hose has a service record of many years.

All fire hose, regardless of type, should bear the approval of the Underwriters' Laboratories.

Fire hose should be reserved and used for fire or other emergency purposes only. Hose removed from active fire service and maintained for domestic use should be plainly identified to avoid the possibility of the hose being returned to the fire service.

All fire hose should be inspected frequently and tested hydrostatically at annual intervals. (Linen hose not included).

Definite records should be kept of each length of hose showing quantity on hand, make, size, date of purchase, when tested and condition at time tested.

All hose couplings for use outside and all hydrant or standpipe nipples should be the same size as that used by the public fire department which may be called on for aid.

Trucks should be considered where it is not practical to provide adequate hose and equipment at each hydrant to cope with fire at certain locations.

At least twice a year all fire hose should be removed from the fire truck, standpipes, reels, and in the hose houses should be repacked, making sure that the folds or bends are in a different place. Nozzles should be examined for dents or nicks in the tips as this can seriously effect the range of the hose stream. Coupling threads should be checked for any damage.

Where hose carts are used, the storage shed should have a list of equipment the cart should contain. Each week this list should be checked with the equipment on the cart and any deficiencies should be reported on the weekly report.

For detailed information, reference should be made to:

National Safety Council Safe Practices Pamphlet No. 24

National Fire Protection Association Standard No. 198 Care of Fire Hose

National Fire Protection Association Inspection Manual

Factory Mutual; Handbook of Industrial Loss Prevention

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Section 4 FIRE CONTROL AND EXTINGUISHMENT**A. P. No. 4-100 TANKS AND RESERVOIRS****Part VIII****Effective June 1, 1962**

Each fall, the tank heater should be checked to assure that the operation is satisfactory.

For detailed information, reference should be made to:

Part VIII - Page 10

001918

Section 4 FIRE CONTROL AND EXTINGUISHMENT**A. P. No. 4-100 FIRE EXTINGUISHERS****Part VIII****Effective June 1, 1962**

All extinguishers should be refilled immediately after use.

Extinguishers containing water, except the anti-freeze type, should be protected against freezing if installed in unheated buildings, or where the temperatures may drop to around the freezing point.

The use of carbon-tetrachloride extinguishers is not recommended.

For detailed information, reference should be made to:

Part VIII - Page 12

001920

Section 4 FIRE CONTROL AND EXTINGUISHMENT**A. P. No. 4-100 WEEKLY SELF-INSPECTION OF FIRE PROTECTION EQUIPMENT****Part VIII****Effective June 1, 1962**

Each plant and laboratory is required to establish a regularly scheduled program covering thorough inspection of all fire protection equipment. Inspections should be scheduled at definite times and a written record should be maintained. A standard form "Plant Fire Prevention Inspection" has been provided by Factory Insurance Association for use in all plants and laboratories.

The weekly report of the "Plant Fire Prevention Inspection" should be filled out while making the inspection. A copy should be retained in the plant files for review by the F.I.A. inspector.

Any deviation from the plant's established fire safety precautions and procedures observed during an inspection should be noted on the form. For example; in addition to the items listed on the form, attention should be given to the following items during each weekly inspection:

Open Flames:

Established Fire Permit procedures and precautions are observed.

New Construction:

Adequate fire precautions are taken and contractor's employees observe the plant's fire safety precautions.

Exit Facilities:

Are properly maintained for use in case of fire.

For detailed information, reference should be made to:

National Fire Protection Association; "Inspection Manual"
Factory Mutual; "Handbook of Industrial Loss Prevention"
National Safety Council; "Safe Practices" Pamphlet No. 31 and Pamphlet No. 34.

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Section 4 FIRE CONTROL AND EXTINGUISHMENT

A. P. No. 4-100 WINTER PRECAUTIONS FOR FIRE PROTECTION

Part VIII

Effective June 1, 1962

4. Check air pressure of dry-pipe systems daily throughout winter.
5. Check dry-pipe alarms to make certain they operate properly.
6. Blow out all drains at low points in the sprinkler piping to remove any water which may be in the system.

Mains, Hydrants and Valves

1. Make certain there are no exposed or unprotected fire mains.
2. See that hydrants are not leaking and that they drain properly.
3. Keep hydrants and valves free from snow and ice.

Gravity Tanks

1. Make certain that tank heaters and accessories are in good operating condition to prevent freezing of water in tank or riser.

Fire Pumps

1. Keep pump rooms heated.
2. Protect suction from freezing. If suction is taken from open water, make sure that the pipe and intake are located below frost level underground and deep enough in the water to prevent their being obstructed by ice. Intake screens should be kept clear of ice obstruction.

Fire Extinguishers

1. Fire pails, casks or pump tanks in unheated locations should be treated with anti-freeze.
2. Provide heated cabinets for extinguishers subject to freezing in unheated buildings, otherwise provide approved non-freezing type.

For detailed information, reference should be made to:

PART IX - FIRE CONTROL AND
PREVENTION

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<i>Celanese</i> CORPORATION OF AMERICA ADMINISTRATIVE PROCEDURES			Page 1
Section	4	FIRE CONTROL AND PREVENTION	
A. P. No.	4-100	<u>MATCHES AND SMOKING</u>	Part IX
Effective	June 1, 1962		

In establishing rules and regulations concerning the carrying of matches and smoking, the following should be considered:

1. Rules pertaining to smoking and/or carrying of matches, lighters or other flame-producing devices should be established for all parts of the plant. Local codes and regulations concerning either the carrying of matches or smoking should be followed.
2. Restricted areas should be marked clearly with "No Smoking" signs and the "No Smoking" regulation must be enforced. Visitors and outside contractors must be informed of "No Smoking" regulations.
3. Safe, supervised, and convenient areas designated as smoking areas should be provided where smoking is permitted in the plant or laboratory. Smoking areas should be located where there is no fire hazard and where they are convenient to employees. It is emphasized that smoking areas must be located remote from areas likely to contain flammable gases because employees may inadvertently walk out of a smoking compound while still smoking.
4. Smoking areas must be kept clean and free of combustibles. Ash trays, "butt" receptacles or non-combustible disposal receptacles should be provided for locations where smoking is permitted. If personal lighters or matches are not allowed to be carried into the plant, electrical or mechanical lighters should be supplied at the permitted locations.
5. Train employees against reckless smoking and careless use of matches. Cigarette and cigar butts, burned matches, etc., should not be discarded in waste baskets or thrown on floors. All "butts" should be crushed, killing the glow and discarded in the proper receptacle.
6. Proper disciplinary action should be established for violation of the match and no smoking rules.

For detailed information, reference should be made to:

National Fire Protection Association; Handbook of Fire Protection
National Board of Fire Underwriters; Bulletin No. 188
Factory Mutual; "Organizing your Plant for Fire Safety"

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Section **FIRE CONTROL AND PREVENTION**A. P. No. **WASTE STORAGE AND DISPOSAL**

Part IX

Effective June 1, 1962

Plant waste, whether liquid or solid, cannot be disposed of indiscriminately. It is emphasized that a potentially hazardous waste condition must be recognized before it becomes a problem. There is constant need for close observation of the types of waste and the nature of their disposition in the plant and laboratory in order that prompt control measures may be initiated when necessary.

The following suggestions will help cover the general policies for consideration:

1. Provide waste containers of an approved type and size for the requirements.
2. Establish a procedure for painting, lettering or otherwise identifying the cans designated for different types of waste.
3. Establish regular pick-up schedules for all waste to prevent undue accumulation and to maintain good housekeeping.
4. Provide a burning ground at some remote safe location. It is customary at some burning grounds to provide a wire enclosure to prevent flying sparks and embers from spreading fire to other locations. Some plants have provided incinerators for ordinary combustible wastes.
5. An attendant should be on duty at the burning ground during disposal of waste.
6. Adequate fire protection equipment should be provided at the burning grounds.

Flammable wastes often create a hazard problem of catastrophic proportion. If improperly disposed of, they may cause fires and explosions in the plant and laboratory or on adjacent properties, resulting in loss of life and serious fire damage.

For detailed information, reference should be made to:

F. W. Dodge Corporation; Plant Engineering Practice
Manufacturing Chemists' Association, Safety Guide No. 9; "Disposal of Hazardous Waste"
Association of Casualty and Surety Companies; Chemical Hazard Information Series;
"Industrial Waste Disposal"

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Section	4	FIRE CONTROL AND PREVENTION
A. P. No.	4-100	<u>CUTTING AND WELDING OPERATIONS</u>
Effective	June 1, 1962	

Part IX

Structural steel should not be burned, but, welded or drilled without permission from a responsible individual. Individual assigned to do such cutting or welding probably knows absolutely nothing about the strength of the beam being-cut or burned.

The plant or laboratory is responsible for outside contractors and sub-contractors being adequately instructed and supervised concerning the precautions to be taken when they perform any burning or welding on the plant or laboratory premises.

Fire permits must be required of all contractors and should come under the same procedure as the fire permit system in the plant.

For detailed information, reference should be made to:

Page 4 - Part IX

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Section 4 FIRE CONTROL AND PREVENTION**A. P. No. 4-100 PATROLMAN OR GUARD SERVICE****Part IX****Effective June 1, 1962**

Patrolmen are an essential part of the protection organization. Every patrolman or guard should be a fireman, well trained in recognizing fire hazards, and in preventing and fighting fires. The fire safety of the property is in their hands when other employees are absent - - nights, Saturdays, Sundays, holidays, and any other shutdown periods.

The following points should be considered in determining and establishing good reliable patrolman or guard service.

1. Determination of route to provide adequate building and area coverage.
2. Selection of patrolmen with proper qualifications.
3. Location of stations so that all important unoccupied areas are visited on each round. Frequency of rounds should be agreed upon by the Factory Insurance Association and the plant or laboratory.
4. For effective coverage, the patrolman service should be supervised by the use of watchclocks and key stations.
5. It is advisable to vary the order in which the key stations are visited.
6. At some locations, depending upon local circumstances, it may be advisable for patrolmen to call headquarters at specific times during their rounds.
7. Patrolmen and guards should be instructed in the operation of sprinkler systems, first aid extinguishers, and other fire protection facilities; and know the location of sprinkler valves and areas controlled by each.
8. They should be familiar with the common fire hazards of the plant and what to look for to prevent fires.

(Continued on Page 8 - Part IX)

For detailed information, reference should be made to:

Factory Mutual; "Watchmen and Their Responsibilities"
Factory Insurance Association; "When the Watchman Takes Over"
Celanese Program for Supervisory Training in Accident and Fire Prevention -
Session No. 22 "Watchman and Guard Services"

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Section 4 FIRE CONTROL AND PREVENTION**A.P. No. 4-100 PROCEDURE IN CASE OF FIRE****Part IX****Effective June 1, 1962**

Each plant and laboratory should establish definite procedures to insure prompt and effective action by all employees at the time of a fire.

It is important that all employees be trained to know the proper procedure for turning in a fire alarm.

Each plant and laboratory should be equipped with fire alarm signal systems that are clearly audible to all persons in the building or plant or laboratory whenever the alarm is sounded in any portion of the building or area.

At the time of fire or other emergency, a definite procedure should be established for the following considerations:

1. Employee will turn in an alarm and remain at the box or location of the fire to direct the fire chief and brigade to the scene of the fire.
2. Fight fire with hand extinguishers if it has not spread beyond such control.
3. If beyond control of extinguishers or inside hose, place nearest yard hydrants and hose into service.
4. Start fire pump promptly (when alarm is sounded).
5. Make certain the means of exit are kept clear.
6. Make certain sprinkler valves are open.
7. Close all fire doors leading to the areas, as well as all windows.
8. Shut off blowers, ventilators and conveyors to keep fire from spreading.
9. Cut off illuminating gas, fuel gas or other combustible gases.

(Continued on Page 10 - Part IX)

For detailed information, reference should be made to:

Association of Casualty and Surety Companies; "Fire Control, Its Equipment, Personnel, Procedure"

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PART X - HAZARDOUS MATERIAL
STORAGE AND HANDLING

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	Section 4	HAZARDOUS MATERIALS - STORAGE AND HANDLING
Part X	A. P. No. 4-100	<u>CHEMICAL PROCESSES - RE-EVALUATION</u>
	Effective	June 1, 1962

Initially a process may be designed with complete safety and the operators involved are thoroughly trained in the safety aspects of their job. However, over a period of time there will be changes in process, equipment, personnel or methods which produce a process quite different in hazard from that which originally existed. It becomes necessary to make a "safety re-evaluation" of that process.

Some of the items which should be considered in a "safety re-evaluation" are:

1. Is there an increase in hazard from the viewpoint of toxicity, fire or explosion?
2. Is the existing equipment adequate to handle the increase in hazard?
3. Are there any pressure or temperature changes which will necessitate recalibration of controlling or relief devices.
4. Is the process subject to any runaway reaction? If so, what can be done to prevent or minimize the effects of such an occurrence?
5. Are the vessels adequately vented? Will the vent material be discharged to a safe location?
6. Is the electrical equipment appropriate for the area?
7. Are there monitoring devices to warn of a build-up in concentration of noxious and/or flammable materials?
8. Are operators trained to know what they must do in the event of any emergency situation?

(Continued on Page 9 - Part X)

For detailed information, reference should be made to:

Inter-Science Publishers; "The Analytical Chemistry of Industrial Poisons, Hazards and Solvents" M. D. Jacobs
 Reinhold Publishing Corporation; "Industrial Solvents" I. Mellon
 "Handbook of Dangerous Materials" N. Irving Sax
 Manufacturing Chemists' Association; Manual Sheets, T. C. Series
 Chemical Safety Data Sheets
 Safety Guide Series
 Association of Casualty and Surety Companies; Chemical Hazards Data Sheets

(Additional References on Page 9 - Part X)

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Section 4 HAZARDOUS MATERIALS - STORAGE AND HANDLING

Part X

A.P. No. 4-100 FLAMMABLE GASES

Effective June 1, 1962

In the interest of safety from fire and explosion, it is important that the characteristics of flammable gases be known and understood by those who use them and that all such employees are thoroughly trained in safe practice for handling and use.

For detailed information, reference should be made to:

Factory Insurance Association; Recommended Good Practice for Safeguarding
Flammable Liquids

Factory Mutual; Handbook of Loss Prevention

Bulletin 36.10; "Properties of Flammable Liquids, Gases and Solids"

U. S. Bureau of Mines; Bulletin 503; "Limits of Flammability of Gases and Vapors"

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Section 4 HAZARDOUS MATERIALS - STORAGE AND HANDLING

A.P. No. 4-100 FLAMMABLE LIQUIDS

Effective June 1, 1962

pensed and used. Insuring that vapors are exhausted to a location well away from potential sources of ignition.

6. All containers holding flammable liquids should be adequately labeled as to contents.
7. All containers should be thoroughly cleaned before being used for a different chemical.
8. Spark-resistant tools and equipment should be used or steel tools can be used provided the tool is continually wet with water.

AVOID HAVING FLAMMABLE LIQUIDS IN OPEN CONTAINERS

General

All electrical machinery, equipment and wiring should conform to Article 500, National Electrical Code in areas where flammable liquids are stored, handled and used.

For detailed information, reference should be made to:

Pages 1 and 2 - Part X

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Section 4 HAZARDOUS MATERIALS - STORAGE AND HANDLING

Part X A.P. No. 4-100 FLAMMABLE LIQUIDS

Effective June 1, 1962

Specific Gravity

Most flammable liquids will float on water, where they can burn freely and flow over a large area. Others are heavier than water, and water will float on them and extinguish a fire. The specific gravity of a flammable liquid is important in determining the proper type of fire extinguisher and whether overflow drains on open tanks of flammable liquids or other special precautions are needed.

Vapor Density

Vapor density is the relative density of the vapor as compared with air. The vapors of all flammable liquids are heavier than air.

Water Solubility

A flammable liquid's miscibility, or ability to mix with water, is important since the flash and fire points of a flammable liquid are appreciably raised as the amount of water in the mixture is increased.

Boiling Point

The lower the boiling point, the more volatile and therefore, the more hazardous a flammable liquid.

The National Board of Fire Underwriters classify flammable liquids into the following three groups.

- Class I: - Liquids with flash points below 25°F. closed cup tester.
- Class II: - Liquids with flash point above that of Class I and below 70°F. closed cup tester.
- Class III: - Liquids with flash point above that of Class II and below 200°F. closed cup tester.

Class I and Class II liquids are considered highly hazardous, requiring the most extensive precautions to preclude the possibility of fire or explosion. Class III liquids are hazardous but not to the same degree as Class I or Class II.

(Continued on Page 3 - Part X)

For detailed information, reference should be made to:

Factory Insurance Association; Recommended Good Practice for Safeguarding Flammable Liquids
Factory Mutual; Bulletin 36.10; "Properties of Flammable Liquids, Gases and Solids"
U.S. Bureau of Mines; Bulletin 270; "Limits of Flammability of Gases and Vapors"
Association of Casualty and Surety Companies; Chemical Hazards Information Series No. C-31; "Flammable Waste Disposal"
Part I - Page 17 "Commercial Hazards Committee"

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Effective	June 1, 1962		

9. Are emergency procedures adequate with controls readily accessible and protective devices located where they can be checked and maintained?

10. What improvements can be made to make this process safer?

Requests for information on safe handling, storage, processing, toxic effects, or other chemical hazards on which reliable information is not locally obtainable, should be directed to the corporate Commercial Hazards Committee.

For detailed information, reference should be made to:
 National Association of Mutual Casualty Companies; Handbook of Organic Industrial Solvents
 American Industrial Hygiene Association; Hygienic Guide Series
 National Fire Protection Association; National Fire Codes Volume I and Volume II
 National Fire Protection Association; Handbook of Fire Protection
 American Petroleum Institute; Accident Prevention Manuals 1A and 1B

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PART XI - DISASTER CONTROL

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A. P. No.	4-100	<u>PLANT EMERGENCY PROTECTION</u>	
Effective	June 1, 1962		

Whenever an emergency or disaster situation occurs, immediate action must be taken if the fullest control of the situation is to be obtained. Careful planning, proper preventive action and training all personnel in their emergency jobs, will avert many disasters and limit the effects of many others.

Outlining duties and functions that are easily adapted to normal plant operation and organization, the following outline presents a guide for just such immediate action.

Each plant and laboratory is required to complete a Plant Emergency Protection Plan. One copy of the completed plan is to be forwarded to the Corporate Director of Safety and Plant Protection, Charlotte, N. C. One copy is to be forwarded to the Insurance Manager, New York Office.

The completed plan, describing what should be done now and what should be done in an emergency, will aid in keeping personal injury and property or material damage at a minimum should an emergency or disaster situation occur. It should also help speed the task of getting the plant back into full production.

For detailed information, reference should be made to:

Chemical Engineering magazine (October 1951); "Plant Defense for Process Industries"
American Machinist magazine (November 13, 1950); "Disaster Control"
Association of Casualty & Surety Companies; "Before Disaster Strikes"
Factory Management magazine (June 1952); "Kansas City Flood Story"
(July 1951); "How to Protect your Plant"
Factory Mutual; Handbook of Industrial Loss Prevention; "Fire Protection During Floods"
National Board of Fire Underwriters; "Flood Problems in Fire Prevention and Protection"
"Hurricane Precautions"
National Fire Protection Association; "Handbook of Fire Protection"

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EXHIBIT

MODEL CELANESE PLANT EMERGENCY PROTECTION PLAN REVISED 12-2-57

I. PURPOSE

The primary purpose of an emergency plan is to reduce to a minimum the injury to personnel and damage to property in case of fire, explosion, building collapse, flood, tornado or release of hazardous materials. Secondly, an emergency plan is intended to assure maintenance of wholesome public relations and the preservation of all evidence pertinent to possible cause.

II. SCOPE

An emergency plan should be practical, simple in form, easily understood and prepared in anticipation of any predictable emergency caused by acts beyond human control or personnel or mechanical conditions originating inside company property. It is essential that each plant anticipate the need for logical coordinated action in the event of any unusual incidents such as fires and explosions.

III. OBJECTIVES

Emergency planning should be handled so that:

- a) There is a clear allocation and designation of responsibility to each of the necessary participating units.
- b) There is adequate personnel available at all times to discharge the designated responsibilities.
- c) Available personnel is adequately trained to discharge necessary functions promptly and competently.
- d) The various units activated by the local emergency plan will immediately and automatically begin to function the instant the alarm is given without waiting for orders and instructions.

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EXHIBIT

5. To be responsible for the casualty list - both dead and injured.
 6. Responsible for the in-plant employee welfare.
 7. Responsible for communications in general.
 8. Answer questions as to employee status due to the emergency.
 9. Prepare furlough lists.
- B. Security Section should be prepared to:**
1. Maintain effective control of vehicular traffic inside the plant and to secure the necessary assistance from local and state police agencies for road-blocks outside the plant area.
 2. Close all outside gates to traffic and permit only entrance of vehicles on the authorized list.
 3. Responsible for notification to personnel on the emergency call list.
 4. Maintain messenger service within the plant.
 5. General Plant Security
- C. Safety Section should be prepared to:**
1. To be responsible for first aid teams and the organization of those teams.
 2. Responsible for the plant protection and security department.
 3. Responsible for the Fire Department, and for the calling of outside fire crews where authorized for assistance.
 4. Responsible for the investigation of the emergency and all investigative reports necessary to this investigation.
 5. To assist and conduct outside investigating personnel such as insurance carrier representatives, local, State and Federal investigative authorities when authorized.
 6. Secure written eye-witness accounts, the recording of all pertinent factual information at or immediately after the time of occurrence.
 7. Photograph apparent pertinent conditions to aid in the investigation.

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EXHIBIT

6. Assemble all personnel to clear area and account for all personnel.
- G. Utility Section should be prepared to:
 1. Sound the alarm.
 2. Maintain all utility services where possible.
 3. Maintain fire line water pressure and to restore any lost utility as rapidly as possible that may add to the safety of the plant.
 4. Assemble all personnel to clear area and account for all personnel.
- H. Medical Section should be prepared to:
 1. Responsible for the obtaining of medical assistance if needed in the plant.
 2. Responsible for the care of the injured.
 3. To provide ambulance service and hospital care from outside sources.
 4. If possible, to check all employees from the affected area for possible injuries before they are permitted to leave the plant.
This should not unduly delay seriously injured persons on the way to be hospitalized.

In response to an emergency, the following groups should be kept in mind for assistance:

1. Outside Fire Crews
2. Departmental Fire Crews off duty.
3. First Aid Teams off duty.
4. Local and State police systems.
5. Plant supervision off duty.
6. Local nurse and doctor teams.
7. Public Service employees if such services are in use at the plant.
8. Off duty plant electricians.
9. Other industrial installations in which Mutual Aid agreements have been made. All outside agencies should be cleared with the Chief Coordinator

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PART XII - REPORTS AND RECORDS

001954

<i>Celanese</i> CORPORATION OF AMERICA ADMINISTRATIVE PROCEDURES			Page 1
Section	4	REPORTS AND RECORDS	
A. P. No.	4-100	<u>FORM GEN 1187 - SUMMARY OF ACCIDENT EXPERIENCE</u>	Part XII
Effective	June 1, 1962		

Form GEN 1187 is completed each month and one copy forwarded to the Director of Safety and Plant Protection, Charlotte, N. C. This is a consolidated report of all the injuries, both major and minor, that occur at the plant or laboratory during the reporting period concerned.

This form is to be completed and forwarded so as to reach the Director of Safety and Plant Protection not later than ten days after the close of each statistical period.

A preparation guide accompanies the sample form included in this guide.

For detailed information, reference should be made to:

001955

SYNOPSIS OF ALL REPORTED INJURIES BY PART OF BODY INJURED		2		Year to Date	
		Month	Year	Date	
HEAD					
EYE					
BACK (INCL. SHOULDER)					
CHEST					
ARM					
HERNIA					
ABDOMEN					
HAND					
FINGER					
LEG					
FOOT					
TOE					
TOTAL					

001957

EXHIBIT

PLANT		MONTH		1									
3		SYNOPSIS OF ALL REPORTED INJURIES BY CAUSE AND TYPE											
CAUSE OF ACCIDENT		TYPE OF ACCIDENT										TOTAL YEAR TO DATE	
Striking Against													
Struck By													
Caught in, on or Between													
Fall to Same Level													
Fall to Different Level													
Slip (not Fall) or Overexertion													
Exposure to Temp. Extremes													
Inhalation, Absorption, Ingestion													
Contact with Electricity													
Charged Objects													
Exposure to Corrosive Liquids													
Explosion													
Not Elsewhere Classified													
TOTAL THIS MONTH													
TOTAL YEAR TO DATE													

EXHIBIT

LOST TIME INJURY EXPERIENCE

6. - Each Investigation of Lost Time Injury (Form GEN-799 Rev. 2-62) should be numbered in sequence, beginning with No. 1 at the beginning of each year. The number assigned to the Investigation of Lost Time Injury concerned should be entered in this space.
7. - Each individual that, due to an accident, lost time during the period reported, should be listed.
8. - Date injury was sustained is not a Lost-Time Day.
9. - Total number of days lost (Saturdays and Sundays included) should be entered.
10. - If Lost Time Injury reported on previous Summary, carries over continuously into the period reported; the original Number of Investigation should be entered, together with the identity of the injured and the actual Date Lost Time Began. Total Number of Days Lost during period reported only should be entered.
11. - If injured, having returned to work, again loses time due to an accident reported on previous Summary, time loss should be charged to original injury. Original number of Investigation and identity of injured should be entered. Actual Date Time Lost Began in period reported, and Total Number of Days Lost in period reported should be entered.
12. - Time charge penalties, invoked against those injuries that come within the provisions of the A.S.A. Method for Recording and Measuring Work Injury Experience should be entered as Days Lost This Period. Once the total penalty has been charged, that injury need not be again listed on any succeeding summary.

ANALYSIS OF LOST TIME INJURIES BY EXTENT OF INJURY

13. - Chargeable Lost Time Injuries only, classified in conformity with the A.S.A. Method for Recording and Measuring Work Injury Experience, should be entered.
14. - Only chargeable Lost Time Injuries that occurred during the period reported should be entered under MONTH. MONTH should conform to the statistical period.
15. - All chargeable Lost Time Injuries that occurred during the current statistical year should be entered under YEAR.

COMPUTATION OF FREQUENCY AND SEVERITY RATE

16. - THIS MONTH; Total Man Hours Worked; Total of man-hours worked by all employees of all departments during the current statistical period reported.
17. - THIS MONTH; Number of Injuries; Total of all chargeable injuries that occurred only during the current statistical period reported.
18. - THIS MONTH; Days Lost Due to Disabling Injuries; Total of all days lost by employees due to chargeable lost time injuries that occurred during the current statistical period reported.

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Celanese CORPORATION OF AMERICA ADMINISTRATIVE PROCEDURES

Page 3

Section 4 REPORTS AND RECORDS

A. P. No. 4-100 CAUSE AND TYPE CODE

Effective June 1, 1962

Part XII

CAUSE CODE

Code Letter	"Cause" of Accident	Definition
A	<u>Structural Hazards</u>	Hazards connected with the structure of buildings, their approaches and yards, outdoor structures, towers, and poles. These include unprotected openings, defective floors or stairs, no guard railings when required, insufficient exits or fire escapes.
B	<u>Inadequate Fire Protection</u>	Any lack or failure of fire fighting equipment.
C	<u>Unguarded or Defective Machinery</u>	Unguarded, ineffectively guarded, defective, or any condition that renders it unsafe. Includes portable machine tools.
D	<u>Unsafe or Defective Tools</u>	Unguarded, defective, improperly used or otherwise unsafe.
E	<u>Unsafe or Defective Equipment</u>	Covers unsafe conditions of all equipment exclusive of tools, and machinery. Includes motor vehicles, chain and rope blocks, jacks, ropes, skids, electrical equipment, ladders.
F	<u>Unsafe or Unhealthy Working Conditions.</u>	Poor housekeeping, unsafe storage of materials, improper ventilation, faulty ventilations, faulty illumination, unsanitation, unsafe lay-out of machinery or operations, unsafe or unhealthful processes (such as fumes, vapors, gases or steam).
G	<u>Inadequate Supervision</u>	Covers supervisory failure in conditions which are specifically the Supervisor's responsibility, such as poor discipline, inadequate instructions, unsafe work methods, and insufficient working force, inexperience.

For detailed information, reference should be made to: (Continued on page 4 Part XII)

001961

Calumet CORPORATION OF AMERICA ADMINISTRATIVE PROCEDURES

Page 5

Section 4 REPORTS AND RECORDS

A. P. No. 4-100 CAUSE AND TYPE CODE

Part XI

Effective June 1, 1962

TYPE CODE

Code Number	"Type" of Accident	Explanation
1	<u>Striking Against</u>	Refers generally to contacts with sharp or rough objects (resulting in cuts, slivers, punctures, etc., due to striking against, kneeling on, or slipping on objects.
2	<u>Struck By</u>	Refers generally to falling, flying, sliding, or moving objects.
3	<u>Caught in, on, or Between</u>	Self-explanatory
4	<u>Fall to Same Level</u>	Self-explanatory
5	<u>Fall to Different Level</u>	Self-explanatory
6	<u>Slip (Not Fall) or Overexertion</u>	Refers generally to slips resulting in strains, sprains, or hernia.
7	<u>Exposure to Temperature Extremes.</u>	Those experiences which result in burning, scalding, freezing, heat exhaustion, sunstroke, or frost bite.
8	<u>Inhalation, Absorption, Ingestion</u>	Those contacts resulting in asphyxiation, poisoning, drowning, and the like, but excluding exposure to temperature extremes.
9	<u>Contact with Electrically Charged Objects.</u>	Such as electrocution or shock.
10	<u>Exposure to Corrosive Liquids</u>	Self-explanatory
11	<u>Explosion</u>	Self-explanatory
12	<u>Not Elsewhere Classified</u>	Self-explanatory

For detailed information, reference should be made to:

001963

<i>Celanese</i> CORPORATION OF AMERICA ADMINISTRATIVE PROCEDURES			Page 7
Section	4	REPORTS AND RECORDS	Part XI
A. P. No.	4-100	<u>FORM GEN 799 - INVESTIGATION OF LOST TIME INJURY</u>	
Effective	June 1, 1962		

Every accident that occurs should be thoroughly investigated as soon as possible to determine why the accident happened and to prevent any recurrence.

Form GEN 799 Investigation of Lost Time Injury is completed for each disabling injury that occurs in the course of or arising out of employment. One copy of the completed investigation should be forwarded to the Director of Safety and Plant Protection as soon as possible after the accident occurs.

The form has been so designed that completing the report is really quite simple. The various headings are self-explanatory.

In describing the accident and injury, the report should be written so that persons unfamiliar with the occurrence will know or understand just what the injured was doing, what was done that was wrong, or what unsafe condition should be corrected.

To provide the plant or laboratory concerned with the fullest experience, knowledge and good judgement available, each Investigation of Lost Time Injury report received is reproduced by the Director of Safety and Plant Protection. A copy is forwarded to the safety organization at each plant and laboratory and their comments or suggestions to prevent any recurrence are returned to the plant where the injury occurred.

When possible, photos or illustrations describing the accident should accompany the completed investigation report.

For detailed information, reference should be made to:

Part VI; page 1; "Accident Investigation"

001965

Colanese CORPORATION OF AMERICA ADMINISTRATIVE PROCEDURES

Page 9

Section 4 REPORTS AND RECORDS

A. P. No. 4-100 SUPERVISOR'S REPORT OF ACCIDENT; FORM NY-1388

Part XII

Effective June 1, 1962

When an accident occurs, the injured's supervisor promptly makes an investigation. The Supervisor's Report of Accident, Form NY-1388, is provided to help guide the supervisor report the cause of the accident and corrective action taken or recommended.

When completed, this form is forwarded to the Plant Safety Department. In cases of minor injury involving doctor's or medical treatment with no permanent disability or time lost from work, this investigation report may prove sufficient. Serious accidents and injuries demand more detailed investigation.

The Plant Supervisor of Safety and Plant Protection reviews each completed investigation report and tabulates the date. He checks this report, principally to determine the nature of injury, cause of the accident, corrective measures taken and the probability of an accident occurring in another department or another plant from the same cause.

At times it may be necessary for the Supervisor of Safety and Plant Protection to visit the scene of the accident and assist the supervisor or Foreman obtain the essential data. Reported accidents which may be unusual or which could cause other severe or numerous accidents of a similar type or which require detailed investigation to determine the cause and corrective action demand investigation by the Plant Supervisor of Safety and Plant Protection.

For detailed information, reference should be made to:

Page 11 - Part XII

001967

Celanese CORPORATION OF AMERICA ADMINISTRATIVE PROCEDURES

Page 11

Section 4 REPORTS AND RECORDS

A.P. No. 4-100 INJURY REPORT

Part XII

Effective June 1, 1962

So that the Foreman or Supervisor in charge of a job may be informed every time one of his men reports to the Medical Dispensary or First Aid for treatment of an injury, some of the plants employ this "Injury Report" form.

The Medical Dispensary fills out the form when the man is treated and sends it direct to the Foreman. The Foreman then checks with the injured, investigates the accident and returns the form, with his comments, to the Supervisor of Safety and Plant Protection.

For detailed information, reference should be made to:

001969



Section 4 REPORTS AND RECORDS

A. P. No. 4-100 FORM GEN 800 - FIRE REPORT

Part XII

Effective June 1, 1962

For each fire and/or explosion that occurs, including explosion when no fire occurs, Form GEN 800 FIRE REPORT is completed and one copy is forwarded to the Director of Safety and Plant Protection.

Should a serious fire or explosion occur, more detailed report must be made. Such special circumstances will be handled individually as they occur.

Each Fire Report will be reviewed and analyzed by the Director of Safety and Plant Protection and will be distributed to all interested corporate executives and plant and laboratory safety organizations.

Because some plants use multilith reproduction and other plants use mimeograph or ditto reproduction, Form GEN 800 is furnished on blank paper with the heading "FIRE REPORT" printed in red. Each plant prepares the report to conform to the outline as shown on the sample form included in this guide.

For detailed information, reference should be made to:

001971

Section 4 REPORTS AND RECORDS**A. P. No. 4-100 CLASSIFICATION OF INJURIES****Part XII****Effective June 1, 1962**

An injury is classified as chargeable or reportable only by the corporate Director of Safety and Plant Protection and only after careful review of the Investigation of Lost Time Injury (Form GEN 799) which is required for each major injury.

Conflicting Opinion:

After an injury has been classified, should the plant or laboratory disagree with the classification, the plant or laboratory organization may request the Director of Safety and Plant Protection to submit the case to the American Standards Association for a final decision by a Committee on Interpretations.

Reclassification:

An injury is reclassified from minor to major, either chargeable or reportable, when the injury (or treatment) interferes with normal performance of regular job and the injured becomes unable to work on any one or more days and/or when determination is made of permanent disability.

For detailed information, reference should be made to:

Page 14 - Part XII

001973

Celanese CORPORATION OF AMERICA ADMINISTRATIVE PROCEDURES

Page 17

Section 4 REPORTS AND RECORDS

A. P. No. 4-100 HEART CASES AND OTHER QUESTIONABLE INJURIES

Part XII

Effective June 1, 1962

Heart attacks, loss of hearing, fume exposure, back injuries, dermatitis and any other cases where it is felt there is the possibility the employee may file a claim, must be promptly and thoroughly investigated. These cases may not be charged against the plant or laboratory injury record. However, Form Gen-799 "Investigation of Lost Time Injury" report should be completed. The original copy should be retained and two copies forwarded to the Director of Safety and Plant Protection.

Any injury that occurs in recreational activity sponsored by the Corporation or any of the subordinate or affiliated companies, should also be considered. Two copies of the completed Form Gen-799 should be forwarded.

On receipt of the investigation reports covering such questionable cases, the Director of Safety and Plant Protection will forward one of the two copies, together with any comment on the case, to the Corporation's Medical Director.

These reports will be considered separate and apart from the "Chargeable" and "Reportable" classification procedure described on Pages 14 and 15, Part XII of this Guide. The Medical and Legal Departments are concerned with any unusual case, which may become a compensation claim whether or not any lost time is involved. The decision as to whether or not an investigation should be made rests with the plant or laboratory organization and the plant physician.

Plant and laboratory organizations should work very closely with the insurance claim adjusters on all cases.

For detailed information, reference should be made to:

001975



ELANES CORPORATION ADMINISTRATIVE PROCEDURE

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Section	4	REPORTS AND RECORDS
A. P. No.	4-100	<u>REPORTING FIRE OR EXPLOSION</u>
Effective		Revised April 30, 1970

Part XII

H. J. Kolodner	3201 Selwyn Avenue Telephone: 525-7301 (Area Code 704)	Charlotte, N.C. 28209
W. H. Nangel	72 Center Street Telephone: Wells 5-0248 (Area Code 516)	Hicksville, N.Y.
J. J. Ryan	71 Addison Drive Telephone: 647-0284 (Area Code 201)	Basking Ridge, N.J. 07920
P. M. Campbell	8 Sedgwick Road Telephone: CA 5-2649 (Area Code 914)	Lake Carmel, N.Y. 10512

The Insurance Manager will inform the insurance brokers at their New York office. The brokers will notify the Factory Insurance Association.

As outlined on Page 13, Part XII, Form Gen-800, Fire Report must be completed for each fire and explosion that occurs, including explosion when no fire occurs, and one copy forwarded to the Director of Safety and Plant Protection.

For detailed information, reference should be made to:

Page 13 - Part XII

001977



ELANESE CORPORATION ADMINISTRATIVE PROCEDURE

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Section 4

REPORTS AND RECORDS

A.P. No. 4-100

REPORTING BOILER AND MACHINERY ACCIDENTS

Part XII

Effective

Revised April 30, 1970

order named. The individual so contacted by the Plant Manager will be responsible for notifying each of the other personnel listed below:

H. J. Kolodner

3201 Selwyn Avenue
Telephone: 525-7301
(Area Code 704)

Charlotte, N.C. 28209

W. H. Nangel

72 Center Street
Telephone: Wells 5-0248
(Area Code 516)

Hicksville, N.Y.

J. J. Ryan

71 Addison Drive
Telephone: 647-0284
(Area Code 201)

Basking Ridge, N.J. 07920

P. M. Campbell

8 Sedgwick Road
Telephone: CA 5-2649
(Area Code 914)

Lake Carmel, N.Y. 10512

For detailed information, reference should be made to:

Page 20 - Part XII

001979

Section 4 REPORTS AND RECORDS**A.P. No. 4-100 REPORTING (NEAR MISS) ACCIDENTS WHEN NO INJURIES OCCUR****Part XII****Effective June 1, 1962**

"Near Miss" accidents, even though injuries to personnel may or may not occur, usually cause loss of materials, damage to equipment and loss of production. Another accident, from the same causes, undoubtedly could result in serious injury to personnel in addition to equal, or greater economic and production loss.

All "near miss" accidents should be investigated by supervision and reported to the Supervisor of Safety and Plant Protection.

Thorough investigation of "near miss" accidents will permit prompt corrective action and prevent the injuries that could result from any recurrence of accidents from the same causes.

Should a "near miss" accident reveal information that would be applicable to the other plants or laboratories, the details of the "near miss" accident should be sent to the Director of Safety and Plant Protection, Charlotte, N. C. It will then be included in the "Near-Miss" Bulletin program described in Part II, Page 21 of this reference guide.

For detailed information, reference should be made to:

Part II, Page 21; "Near Miss Accident Bulletin"

001981

Section 4 REPORTS AND RECORDS**A. P. No. 4-100 Form GEN 1188 Rev. 6-61
Effective MONTHLY SUMMARY OF OFF-THE-JOB ACCIDENTS
June 1, 1962****Part XII**

One copy of Form GEN 1188, Rev. 6-61, should be completed and forwarded so as to reach the Director of Safety and Plant Protection, Charlotte, N. C. not later than ten days after the close of each statistical period.

Every employee injury that occurs as the result of an accident off the job and causes time lost from work should be recorded on this form according to the cause or type of accident.

Accidents to dependents should be included only when the employee involved loses time from work. "Days Lost" in the "Dependents" column is intended to mean the number of days lost by an employee because of an off-the-job injury to a dependent.

Should a fatality result from an off-the-job accident there is no charge under "Days Lost". A brief description of the accident causing the fatality should be entered in the "REMARKS" portion of the form.

For detailed information, reference should be made to:

001983

EXHIBIT

FORM NO. 19
REVISED 9-1-59

LEAVE
BLANK
FOR CLIP

EMPLOYERS REPORT OF ACCIDENT TO EMPLOYEE

COMPLETE THIS REPORT IMMEDIATELY ON OCCURRENCE OF ACCIDENT.
DO NOT HOLD FOR SURGEON'S REPORT. MAIL IN TRIPPLICATE TO

• KEMPER INSURANCE •

- ☐ LUMBERMENS MUTUAL CASUALTY COMPANY
☐ AMERICAN MOTORISTS INSURANCE COMPANY

LIBERTY LIFE BUILDING

112 SOUTH TRYON STREET

CHARLOTTE 2, NORTH CAROLINA

Use of this Form is Required Under Provisions of the Workmen's Compensation Act

NORTH CAROLINA INDUSTRIAL COMMISSION

RALPH

This Report Filed Only in Compliance with Section G.S. 97-92

and Not Employed's Claim for Compensation

I. & FILE NO.
EMP. CODE NO.
CARRIER CODE NO.
CARRIER FILE NO.
CODE NUMBERS FURNISHED EACH EMPLOYER AND CARRIER SHOULD BE INSERTED BEFORE MAILING.
(REFER TO I. & FILE NO. IN ALL CORRESPONDENCE ABOUT THIS CLAIM).

ON FATAL AND OTHER SERIOUS CASES
TELEPHONE EDISON 3-5741
OR TELEGRAPH

EVERY QUESTION
MUST BE ANSWERED

THIS REPORT MUST BE TRANSMITTED TO THE COMMISSION THROUGH YOUR INSURANCE CARRIER.

POLICY NUMBER	ISSUE	ACCIDENT	STATE	CITY	AGENT NO.	CODE	WAGE	STATE	CITY

Employer	1. Name of Employer.....	City or Town.....	State.....
	2. Office address: No. and St.....		
	3. Insured by ☐ LUMBERMENS MUTUAL CASUALTY COMPANY ☐ AMERICAN MOTORISTS INSURANCE COMPANY		
	4. Give nature of business (or article manufactured).....		
Time and Place	5. (a) Location of plant or place where accident occurred..... County..... Department..... State if employer's premises.....		
	(b) If injured in a mine, did accident occur on surface, underground, shaft, drift or mill.....		
	6. Date of Injury.....19..... Day of Week..... Hour of day..... A.M. P.M.		
	7. Was injured paid for entire day..... 8. Date disability began..... 19..... A.M. P.M.		
	9. When did you or foreman first know of injury.....		
	10. Name of foreman.....		
Person Injured	11. NAME OF INJURED.....	City or Town.....	State.....
	12. Address: No. and St.....		
	13. Check (x) Married....., Single....., Widowed....., Widower....., Divorced.....; Male....., Female.....; White, Colored.....		
	14. (a) Nationality..... 14. (b) No. of children under 18 years.....		
	15. Age..... Did you have on file employment certificate or permit.....		
	16. (a) Occupation when injured..... (b) Was this his or her regular occupation?..... (If not, state in what department or branch of work regularly employed).....		
	17. (a) How long employed by you..... (b) Wages per hour \$.....		
	18. (a) No. hours worked per day..... (b) Wages per day \$.....		
	(c) No. days worked per week..... (d) Average weekly wages incl. overtime \$.....		
	(e) If board, lodging, fuel or other advantages were furnished in addition to wages, give estimated value per day, week or month.....		
Cause of Injury	19. Machine, tool or thing causing injury..... 20. Kind of power, (hand, foot, electrical, steam, etc.)..... 21. Part of machine on which accident occurred.....		
	22. (a) Was safety appliance or regulation provided..... (b) Was it in use at time.....		
	23. Was accident caused by injured's failure to use or observe safety appliance or regulation.....		
	24. Describe fully how accident occurred, and state what employee was doing when injured..... (Statement made without prejudice and without veering for the correctness of information contained therein.)		
	25. Nature and location of injury (describe fully exact location of amputations or fractures, right of left).....		
Nature of Injury	26. Probable length of disability..... 27. Has injured returned to work..... If so, date and hour..... At what wage \$.....		
	28. At what occupation.....		
	29. (a) Name and address of physician.....		
	(b) Name and address of hospital.....		
Fatal Cases	30. Has injured died..... If so, give date of death.....		

Do Not Write
In This Space

City

County

Marital Status

Nationality

Age

Weekly Wage

Occ. Class.

Injury Code

001985

Date of this report..... Firm name.....

Signed by..... Official Title.....

LAW REQUIRES REPORT TO BE FILED WITHIN 5 DAYS AFTER KNOWLEDGE OF ACCIDENT

Section 4 REPORTS AND RECORDS**A. P. No. 4-100****FORM GEN 887 - ACCIDENT REPORT OTHER THAN FIRE,
EXPLOSION, EMPLOYEE INJURY OR AUTOMOBILE COLLISION****Part XII****Effective****June 1, 1962**

A detailed report must be prepared and sent to the Insurance Department, New York Office, on every accident or loss that occurs. Losses, other than fire, explosion, employee injury, or automobile collision accident should be reported on Accident Form Gen-887. Distribution is indicated on the form.

For detailed information, reference should be made to:

"Insurance Manual" issued by the corporate Insurance Department

001987

APPENDIX A

RECAP:- Required Reports; with Form No. where applicable, Number of Copies and Date Due at Corporate Safety Department, Charlotte, North Carolina.

All forms, except Fire Report, are ordered from Celanese Fibers Company, Cumberland, Md., Attention: Print Shop

Title	Form No.	Used For	Reference Part Page	Date Due	Number of Copies
Minutes of meeting of Plant Management Safety Committee	None	Reporting transactions of each meeting	I 6	As soon as possible after each meeting	1
Summary of Accident Experience	GEN 1187	Consolidated report of all injuries during the reporting period	XII 1	Last day of each Accounting Statistical Period	1
Investigation of Lost Time Injury	GEN 799	Record facts about each Lost Time Injury	XII 7	As soon as possible after occurrence	1
Fire Report	GEN 800	Record facts about each fire and/or explosion	XII 13	As soon as possible after occurrence	1
"Near Miss" Accidents	None	Record details of accident where no injury is involved	XII 23	As soon as it is convenient after the occurrence	1
Monthly Summary of Off-The-Job Accidents	GEN 1188	Consolidated report of all injuries that occur off-the-job during reporting period	XII 25	Last day of each Accounting Statistical period	1
Off-The-Job Accident Costs Report	None	Record costs of all injuries off-the-job	XII 27	Annually - not later than January 15 of each year	1

001990

INDEX OF CELANESE SAFETY INFORMATION BULLETINS

Issued from July 1957 through July 1963

<u>NUMBER</u>	<u>TITLE</u>
1.	Laboratory Glassware
2.	Check List for Safety Hazards on New Products and Processes
3.	Welding
3. Supp. I	Welding
3. Supp. II	Welding
4.	Ten Point Safety Program - For Engineers Meetings
5.	Control of Static Electricity
6.	Fire Losses
7.	Safety Procedure
8.	Hot Tapping
9.	Pressure in 55 Gallon Drum
10.	Laboratory Safety
11.	Uncoupling Device
12.	Danger of Shock from "Live" Circuits
13.	Newest Research Shows What Causes Plant Fires
14.	First Aid Fire Extinguishers
15.	Auto-Ignition in Thermal Insulation
16.	Fork-Lift Safety
17.	Good Housekeeping
18.	Lubricating Motors
19.	Static Electricity
20.	Safety Procedure for Electrical Work
21.	Schering Research Safety Program
22.	Locking Out

001991

23. Testing Safety Valves
24. Fork-Lift Operations
24. Supp. I Fork-Lift Trucks
25. Safety and Solvents
26. Three Prong Attack on Accidents
27. Do You Handle Compressed Gases Safely?
28. An Application of Gas Chromatography to Analysis of Solvent Vapors in Industrial Air
29. Practical Factors in Safe Welded Repairs to Steel Boilers & Pressure Vessels
30. Safety Rules and Standards - Schering Corporation
31. Another Avoidable Tragedy
32. Oaking of Dry Chemical Extinguisher Powder
33. Heat Build-Up of Fluorescents
34. Reporting Unsafe Conditions
35. Yale University Laboratory Chart
36. Teflon
37. Flameproofing Power Cables
38. Why a Relief Valve
39. How To Ban Fires In Your Mill
40. Galvanizing on Jet Wrenches
41. "Striking Against" Injuries
42. Sparking Characteristics of Metals Used in Tools
43. Flat and Cylindrical Sight Glasses
44. Safety Glass Shield
45. For Lack of a Ladder
46. Load Chain vs. Hand Chain
47. Portable Power Tools - Friend or Foe
48. Grinding Wheels
49. Navy Department Bulletin - Electric Portable Tools & Appliances

- 50. Wood Pulp
- 51. Abrasive Grinding Wheels
- 52. Sewer Gas is a Killer
- 53. Chemcel's portable deluge nozzle
- 54. Pre-planning Safety into the project at Celriver
- 55. Tips on Care & Use of Ropes and Cables
- 56. - DuPont pictures - Tank Entry
- 57. "Electrical Shock" - "A Much-Misunderstood Hazard"
- 58. Tank Truck Fire at GATX in Chicago
- 59. Plan in Advance for Disaster Control
- 60. Electrical Shock Hazards
- 61. Flash Point of Acetone-Water Mixtures
- 62. Tests for Shop Portable Electric Tools
- 63. A New Portable Light for Hazardous Locations
- 64. Accident "J" Curve
- 65. Newark Evening News Article - "Court Upsets Death Award"
- 66. How to Inspect For Accident Prevention; Physical Condition - Buildings
- 67. Non-Stick Fry Pans
- 68. D-P/s
- 69. The Trouble with Safety is People
- 70. Contact Lenses
- 71. Abrasive Wheels
- 72. Difficulties Encountered by Foremen in Safety Work (February, 1962)
- 73. Battery Explosion on Fork Truck
- 74. Hazard Spot Card
- 75. Supervisory Safety Contest
- 76. M.S.A. Explosimeter
- 77. Preventing Oven Explosions

001993

- 78. Last Year's Major Explosions Prod This Year's Safety Push
- 79. Inquiry Indicates Factors Involved in N.Y. Blast
- 80. Safe Cleaning of Oil Tanks.
- 81. Solvent Tank Explosion
- 82. Phthalic Anhydride Tank Explosion
- 83. Safety Valves

001994