CONNECTICUT STATE DEFENSE COUNCIL

MANUAL OF

GENERAL SUGGESTIONS AND ADVICE

FOR

INDUSTRIES AND INDUSTRIAL PROTECTION COMMITTEES

Issued by the
AIR RAID DEFENSE DIVISION

State Armory — Hartford
FEBRUARY, 1942

Bibliography

The War Department has prepared, for issue on loan to Defense Industries, a booklet on "Plant Protection for Manufacturers."

GROUP I

Plants have been widely supplied with each of the two publications below:-

"Protection of Industrial Plants and Public Buildings"
issued by the Office of Civilian Defense.

"Air Raid Defense Preparation for Industrial Plants"
(Handbook No. 12 of the Massachusetts Committee on Public Safety reprinted by permission for the Connecticut State Defense Council.)

These are procurable, in single copies, from the State Defense Council. In quantity, the Massachusetts Handbook is procurable, at cost, through the local Industrial Protection Committee or the local Defense Council. (see State Defense Council Memorandum of 12-22-41.)

GROUP II

Special studies of value are listed below:

**Issued by the Office of Civilian Defense*

***Air Raid Warning System (#11)**

***Glass and Glass Substitutes (P. C. #1)**

***Municipal Signaling Systems (#12)**

***Emergency Medical Service. (M. D. #13)**

In the matter of Blackout, free distribution is made of a 15 page circular by Marc Peter, Jr., on Procedure. A comprehensive booklet by the O. C. D., "Blackouts", is purchasable from the Supt. of Documents at 25c. Handbook #11a of the Mass. Committee (Jan. 1942) contains Blackout Information and a discussion of plant heating and ventilation.

GROUP III

Publications by Associations, Technical Press, Individuals, etc; Consult your local library for reference to recent literature on Air Raid defense, and to issues of the National Fire Protection Association. (Notable among the latter is "Fire Defense", $1.50)

Significant pamphlets by Insurance Companies; for example, "The Incendiary Bomb," (United Mutual Fire Insurance Company) and "Precautions against Fire from Enemy Bombing", (Bulletin #2.50, Associated Factory Mutual Fire Insurance Companies).

A valuable article on "War-time Protection of Industrial Plants" appeared in the January issue of Chemical and Metallurgical Engineering, and is sold in reprint at 25c.

GROUP IV

Digests of Conn. State Defense Council Schools for Air Raid Wardens (July 1941) and Industrial Wardens (Oct.-Nov. 1941). These were issued to people who attended, and a limited surplus was distributed to general applicants. The material on the Industrial Warden School will be made available to local Industrial Protection Committees.

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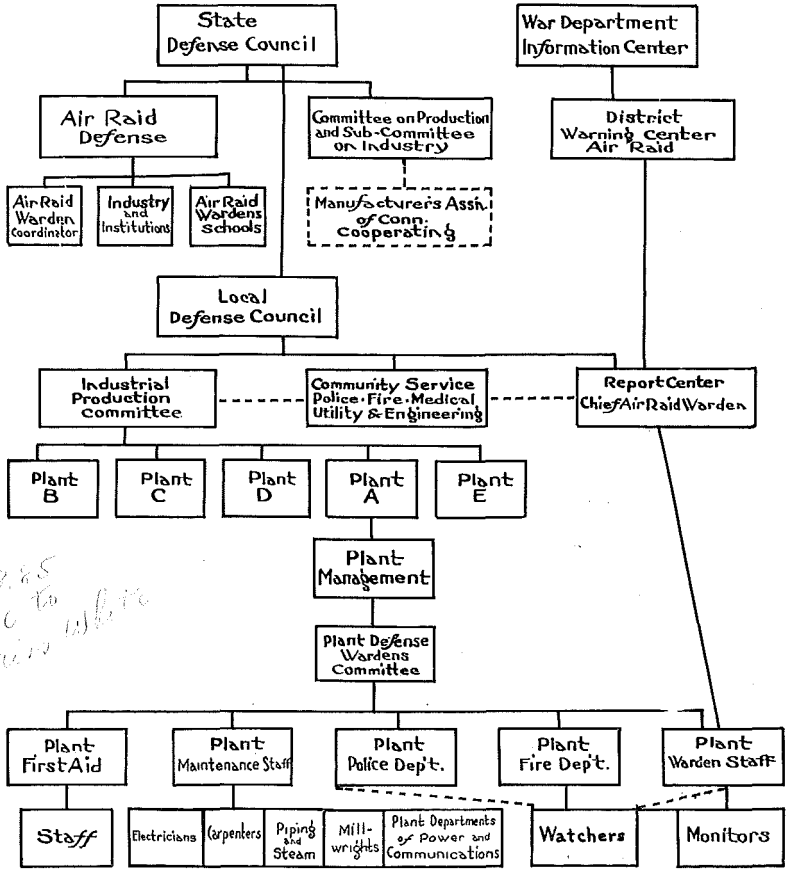

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Introduction

Printed information is now widely distributed respecting Air Raid Defense and much of it has direct bearing on Industrial Plants. This Manual has been prepared for the purpose of correlating such information and organizing it into useable shape for industrial protection. To aid in this, a dictionary of Air Raid Terms and Topics is presented as the main body of the Manual. A few preliminary pages offer an orderly Index of that material, as meeting the needs of

I. Management, which wants to know what it is all about and what steps should be taken to set an effective system of protection in operation.

II. Plant Defense Chief, who must assume the responsibility of organizing a plant defense plan and directing a personnel to carry it out.

III. Local Industrial Protection Committees, which can serve in handling many problems common to all plants, and especially those which involve contacts and relationships outside of the plant borders.

Attention is called to the reading references listed inside the front cover and to the press article of Factory Raid Rules which is reproduced inside the back cover.

A chart shows the relationship of Plant defense to public Defense Organizations and to the War Department. A page of State Defense Council personnel is also included.

SAMUEL H. FISHER,
ADMINISTRATOR

PART I

SUGGESTIONS FOR PLANT MANAGEMENT

Management will necessarily delegate the problem of setting up an Air Raid Defense plan to some plant official, who for purposes of convenience will here be called Plant Warden (see page 28).

He should be supplemented by a Plant Defense Coordinating Committee (see Plant Defense Council, page 26) made up of plant chiefs whose departments will be most directly affected.

He should be named as the Plant Representative on the local Industrial Protection Committee (see page 20) and given free use of his time to attend its meetings, to visit other plants, and to contact community leaders.

He should report back to Management for approval of his plan after it is formulated.

In this connection, Management should consider such matters as:

a. Volunteer Service, in organizing plant defense staff (see page 28).

b. Staff Training, as related to Company Time (see page 25).

c. Problems of Blackout (see page 13) and Camouflage (see page 16).

One of the urgent problems of Management is to enlist a Plant Defense Coordinating Committee or Defense Council (see page 26) for a study of current plant hazards with regard to

1. Operational Breakdown (see page 27).

2. Sabotage (see page 30).

and the setting up of special Inspection and other service to guard against them.

PART II

SUGGESTIONS FOR THE PLANT WARDEN

The duty of the plant warden is:

a. to survey the plant, determine its points of especial vulnerability, and set up a plan to provide for these.

b. in doing this, to provide for at least three essential needs in case of air raid; namely,

1. Strategically situated staff to report and fight incendiary bombs.

2. Departmental lieutenants to direct and control movement of employees.

3. Free lines of communication to receive and transmit Warnings and to receive and respond to reports from his staff. (see Action Under Air Raid, page 12).

c. to confer and set up working procedures with

1. The local Chief Warden and his Report Center (see page 29).

2. The Plant Defense Council (see page 26).

3. The local Industrial Protection Committee (see page 20).

A. In his **Plant Survey,** he should consider:

Bottlenecks (see page 25).
Glass (see page 20).
Lighting problems (see page 19).
Shelter (see page 30).

B. In his **Defense Plan,** he should consider:

1. Communication problems (see page 25).
2. Plant Signals, (see page 27).
3. Equipment (see page 19).
4. Employee Movement Problems (see page 18).

C. In his **Staff Organization,** he should consider:

Volunteer Service (see Plant Defense Staff, page 26).

Staff Training (see page 27).

General Plant Employee Instruction (see page 17).

Staff Report Form for "Incidents", (see page 29).

D. In his relation with the **Industrial Protection Committee,** he should attend committee meetings, hold conferences, and consult other plants with defense organization. He should arrange with Chief Air Raid Warden about receiving Warnings and transmitting reports and calling for help when needed. (see page 16).

He should arrange with City Water Department and Utilities about interruptions and restoration of their services at the plant.

He should arrange with local Police and Fire authorities about methods of coordinating his plant practices with their own.

He should, if his plant is isolated in a community, work out special problems with the Chief Air Raid Warden (see page 22).

E. In his action under **Air Raid,** he will be prepared to deal with Incendiary Bombs (see page 15, and note particularly the use of Automatic Sprinklers, see page 31).

Explosive Bombs (see page 15).

Gas Bombs (see page 15).

He should have provided against Panic (page 24) and also for urgent demands for

Emergency Repair (see Mobile Corps, page 23).

First Aid (see page 19).

F. **Plant Services** required in Defense should assure that the plant is provided with:

a. Warden's Staff, including

1. Deputy Wardens, to act for him when he is out of the plant or away from his office; thus, assuring 24 hour service at his office. (see h, on page 8).

2. Lieutenants, to act as group leaders for emergency movement of employees. (see Monitors, page 23).

b. Air Raid Staff, sufficient to deal with incendiary bombs if they fall on roofs or, more likely, penetrate them and lodge on the floor below. Also, if the bomb starts a fire too large for one man to deal with, there should be a Fire Staff to assist him in regular fire fighting. (See Defense Staff, page 26, and also Appendix, page 32).

c. Guard Staff, sufficient to control gates, handle panic, and direct traffic in case of outside help is called in.

d. Inspection Staff (which may be a part of the Fire or Guard Staffs) to make frequent inspections of sprinkler valves, gas valves, electric switches, fire extinguishers, stored materials, and "fire traps". (see page 26).

e. First Aid Staff - which shall be available to render personal aid to injured until regular medical service arrives. If the plant has a regular medical staff, the Warden's Air Raid Staff may be trained for this First Aid. Otherwise, another group of employees should be developed for the purpose. (see page 19).

f. Repair Squad - known as Mobile Engineering Corps which should be able to do temporary jobs on structures, piping, wiring, and to handle heavy metal units. (see page 23).

g. Fire Watcher (or Spotter) Staff (which may be a part of the Air Raid Staff, Fire Staff, or Guard Staff) - to watch during an "alert" for any "incident" from above (see Alert, page 13, and Watcher, page 32).

h. Deputies - If a Plant operates only on day shifts, it will need only one organization of the type outlined above. That should, however, be large enough to permit of a skeleton section to maintain watch on a 24 hour basis.

If a plant operates not later at night than 1 A. M. its defense staff for the second shift should be a duplicate of that for the first shift, with a skeleton section for the interval until the day period.

If a plant operates for the full 24 hours, it needs to have three full relays of its Defense Staff.

It is understood that, except for the plant warden, all staff members will work usually at their regular occupations; only leaving them to assume their emergency duties when so directed.

PART III

SUGGESTION FOR INDUSTRIAL PROTECTION COMMITTEES

A. **Institutions other than Industrial.** - A matter of very direct bearing upon the general safety of the community, and closely related to the industrial problem, is Air Raid Defense for such institutions of 24 hour occupancy as Hotels, Hospitals, Boarding Schools, Colleges, Camps, State and County Institutions, local "Homes" and similar collections of people in residence, including large Apartment blocks.

It is obvious that these require some general type of defense organization, - particularly with respect to incendiary bombs, - and may greatly benefit from the counsels of the Industrial Protection Committee. Particularly through some such contact, the Chief Air Raid Warden will find it most practicable to establish and promulgate instructions for coordinating their procedures with these of the community at large, - as for Blackouts, Warnings, Reports of "incidents", and calls for service.

Industrial Protection Committees should consider whether

(a) to appoint sub-committees to aid in formulating plans with representatives of these institutions, or

(b) to admit their delegates to representation on or attendance at meetings of the Committees or, in large cities,

(c) to advise the Chief Air Raid Warden in setting up a separate "institutional protection committee" to parallel the Industrial Protection Committee in studying the defense problem of its constituent units.

B. **Plant Problems in Emergency Protection.** In the preceding sections of this manual, there have been included various suggestions which are pertinent subjects for consideration by Industrial Protection Committees. The problems brought to the Committee by the plant representatives may involve both Air Raid Defense and broader issues dealing with operational hazards under stress of war production. It is suggected that a constructive approach to both types of problem may be made by observing the following principles:

1. Provision for the particular hazard of Air Raid may effectively include provision for the more general hazards of current plant operation.

2. The solution of plant problems may be made so as to provide solution also for related problems of the community. For example,

(a) In time of Air Raid the demands upon the community Services of Fire, Police, Medical, etc, may be so great as to preclude or greatly reduce their availability to plants. Thus defense provisions set up in plants will realize a net increase in the protective power of the community as a whole; and in extreme emergency may even be rendered serviceable to the community need.

(b) For police auxiliaries, particularly, the enlargement of plant police staffs - who may be sworn in as deputies of the civil force and so given insignia, arms, and power of arrest — will serve to strengthen plant protection and at the same time enlarge the reserve force of the local constabulary.

3. In case of Air Raid, the plant consequences are likely to be felt in

A. Panic and resulting Personal Injury

B. Conflagration from Incendiary Bombs

C. Shock Effects from Concussion of Explosives in the Vicinity

To maintain control under these conditions will require in the first instance a close and unfailing contact with the local Report Center; with it, a well-knit corps of emergency men within the plant; and a means of quick communication between them and the plant Defense Headquarters. This involves the preparation of a detailed plan of procedure to be followed in case of an "incident" in any part of a plant.* It thus contemplates some form of advance instruction to employees, not only to prepare them for sudden and unusual changes in plant routine but also to apprise them of the Emergency staff to whom they are to look for direction and leadership. Methods of extending such instruction may well be the subject of general conference in the Committee.

Special booklets of instruction have been issued on the technique of Air Raid defense, such as Methods of dealing with Incendiary Bombs, Treatment of Windows and Skylights against dangers of Blast and Concussion, etc. Attention is called to the Summary of Lectures presented at the Industrial Warden School at Hartford, late in 1941. These summaries have been sent to all the registrants at this school and are available for any Industrial Protection Committee.

Beyond this, the problem is simply of organization and technique. It will vary with plants, according to their existing organization and special conditions.

In a plant already relatively self-sufficient (i. e. having in its own setup and control the basic Services required in Air Raid attack) a complete plan of protection can be organized with the minimum of time and expense. Such a plan is outlined, in one form, in the pamphlet, "Protection of Industrial Plants and Public Buildings" issued by the Office of Civilian Defense.* A plant lacking in one or, at most, a few of the essential departments or staffs for its self defense, would be well advised to complement its existing organization by the addition of the necessary functions, or by assuring their immediate availability from without. It may be found that a survey of the existing employees will reveal individuals whose previous training makes them available for these emergency functions. For plants normally possessing only one or two of the essential emergency Services, definite and exact provision should be made in advance for their servicing at need. This may become a major problem of the local Industrial Protection Committee.

Many small plants are without more than a skeleton or formal provision for any emergency action. Such plants are necessarily to be considered as wards of their local community and their cases should promptly be reviewed by the Industrial Protection Committee and discussed with the Chief Air Raid Warden for specific consideration.

As it is believed that members of the Industrial Protection Committee will be closely related to the Defense program at their several plants, and will thus have occasion to acquaint themselves with the material in this manual, no specific references are here made to topics in the following pages of this Manual.

Attention is, however, called to the special question of Isolated Plants, as considered on page 22.

The Chart in this Manual presents a variation of that issued by the Office of Civilian Defense.

PART IV

AIR RAID TERMS AND TOPICS

ACTION UNDER AIR RAID. — Plant watchers are on duty, ready to report any "incident" to Plant Defense Headquarters. Falling of small metal pieces will be noted in the Log book of the Watcher but not reported unless causing serious damage. Bombs and resulting fires are the principal consideration. Damage by explosive bombs (see page 15) will be reported, with particular reference to any falling within the plant. The Plant Defense Headquarters will be ready to send any necessary Plant Service on receipt of report. Services will move at once, using well-protected plant vehicles or metal hats. See also Report Form (page 29) and Mobile Corps (page 23).

AIR RAID ALARM. — There are, nominally, three. The first two are **confidential advance warnings,** for Plant Defense Headquarters and Key men of the defense staff, only. (See Blue, page 14: Alarm, page 12: Yellow, page 32). The actual Danger Alarm will be made publicly, so that all members of the plant and the community may be warned. (See Red, page 29). The Public Signals are:

Danger: — The alarm signal will consist of a series of short blasts on a siren or whistle or, if given by bells, a constant ringing of those bells.

All Clear — The "All Clear" signal will consist of a long, continuous blast, or if given by bells, a slow tolling of the bells.

AIR RAID DAMAGE. — Enemy Aircraft over the plant presents immediate danger of metal from anti-aircraft barrage, or projectiles from defensive aircraft. If engaged in air duel, the bomber may unload in order to effect quick escape. Wilful sowing of bombs (incendiary) may take place during ordinary transit and explosive bombs (probably under 100 lbs) may be dropped over cities or industrial areas. The bomber may try a "target" hit, more or less wide of the mark, with High Explosive Bombs. The extreme danger, and the rarest, is "dive bombing" which assures a direct hit by High Explosive bomb.

AIR RAID INSTRUCTION. — See Air Raid Warden Schools (page 13) and Plant Staff Training (page 27).

AIR RAID WARDEN SCHOOLS. — Three State Schools were held in 1941: one in New Haven, 4 days, in July; one in Hartford, 9 nights, in July; and an Industrial Warden School, in Hartford, 3 days, in October. Numerous local schools have been held, for city or inter-city regional groups; for the most part under Standard Course of Instruction approved by the Office of Civilian Defense. Beginning March 1, 1942, a Standard Course was published in outline by that Office. Industrial Warden Schools have also been held in certain industrial communities under local direction. In all these schools, the course of instruction covers the duties of Wardens in dealing with Air Raid bombs of various types, in serving the communities of their areas, and in cooperating with the established Services of Fire, Police, Medical Aid, etc. (See also Staff Training page 27).

AIR RAID WARNINGS. — See Air Raid Alarm (page 12) and Plant Warnings (page 28).

ALERT. — Term used for the period when official warning has been received that hostile aircraft will soon be overhead. For the public, this is on the Danger Alarm. For Plant and other Warden Staffs, it may be on the advanced warnings. (See page 28).

ALL CLEAR. — An official signal, designated at Report Center by a White light, that hostile aircraft have left the skies. It is made public by a long, continuous blowing of whistles or sirens, or a slow tolling of bells.

AUTOMATIC SPRINKLER SYSTEM. — See Sprinkler System (page 31).

BLACKOUT. — A condition ordered at night, when no lights are to be visible from above, and only the faintest gleams are permitted in public to facilitate movement of vehicles or people. The present Code of the State Blackout Committee calls for Blackout when the Danger Alarm is sounded at night. It is apparent that most plants will be more influenced by the **length of the period of blackout** than by the time or frequency of its occurrence. It is contemplated that this period, being simply for the period that hostile craft will be traveling overhead at an estimated speed of 300 miles per hour, will not be long. While a series or combination of such passages would operate to extend the period, there is as yet no definite ground to anticipate an occurrence of this sort.

As some interval will be required to turn normal factory conditions into blackout conditions, it is important that provision be made for the receipt of all preliminary (confidential) warnings and for the operating staff for blackout to be at posts ready to start or, if necessary, to complete the transition to blackout immediately upon the public Danger Alarm. That there will necessarily be some interference with productive routine is expected. Indeed, many plants expect some such interruption at time of public warning, irrespective of blackout. (See Movement of Employees, page 18 and Sabotage, page 30).

Regardless of the length of the blackout period, the necessity for some essential illumination (see page 19) requires that immediate provision be made in this regard, as also for the complete shading of such illumination to prevent penetration to the outside. Blackout procedures may best be studied in special publications (see Bibliography, inside Front Cover) and discussed in Industrial Protection Committee (see page 20).

Engineers of Plant power houses or of the servicing utilities should be brought into conference about the warnings and related administrative problems contingent upon sudden and extensive decreases in the power load.

BLAST. — See Bomb, High Explosive (page 15) and Glass Protection (page 20).

BLUE. — An official Warning, confidentially sent to Report Center (by means of a Blue light signal) to indicate the movement of hostile aircraft in the direction of the warned area. It is the second in the series of such signals (coming after Yellow, see page 32) and may be followed by a Red signal for Public Danger Alarm.

BOMB. — Bombs rarely fall straight down. They come at a slant of 10° to 40° from vertical, according to the elevation and speed of the plane dropping them. Thus, they may strike walls and windows of unshielded buildings, as well as roofs. Their penetration depends upon their weight, velocity, and angle of hit.

Delayed Action — An explosive bomb with fuse set to permit of penetration below the surface struck before explosion. Its effect in buildings is to create interior wreckage, while underground it may have quake effects, breaking main piping and shaking or disrupting foundations. Usually a High Explosive.

Dud — An explosive bomb that has failed to explode on landing. It is to be treated the same as a Time bomb. (See below.)

Electron. — See Incendiary, below.

Explosive. — A bomb that is charged to explode usually upon or soon after landing. Its effect is both by concussion and by scattering of fragments of its shell. Fragmentation bombs are rarely used except where large concentrations of people in the open are expected. Demolition bombs, creating effect by concussion, may be of relatively light weight (for ease in carrying over long distances) and of minor destructive effect. Bombs up to 100 lbs. may be considered of this class. For heavier bombs, see High Explosive, below.

Gas. — See Gas Attack (page 19).

High Explosive. — A bomb, from 500 lbs. up to one or two tons in weight, which does the greater part of its damage by concussion, - demolishing structures, roads, underground foundations and pipes, and indirectly causing conflagration through rupture of gas mains, etc. One of its most serious effects upon persons is in shattering glass panes over a wide area, either inward or outward, which fill the air with sharp flying pieces. (See Glass Protection, page 20). A direct hit is not preventable and, for the area immediately affected, not to be defended against. Most plans of structural protection are based on the assumption of a "near miss" at least 50 feet away. Buildings with floor-bearing walls are those most vulnerable to shock effects from these bombs.

Incendiary. — A bomb charged with inflammable material which burns at a high heat and induces combustion in surrounding materials. That most used is the 2.2 lb. magnesium bomb (called "Electron") with a thermite fusing element. It may be expected to penetrate any ordinary roof or window, probably also a wooden wall, and lodge upon the floor beneath. It spurts fire at about 4000 degrees F. for a few moments and then burns its Magnesium Shell at about 2000 degrees F. for 10 or 12 minutes. During this time, it is likely to set afire any combustible material in its vicinity. If the induced fire is quenched the bomb itself may be reduced in its effect and removed from the building. It can be approached after the first 3 minutes and (after the surrounding fire is controlled) may be handled effectively by smothering agents (sand, etc.) or by light water spray which speeds up the subsequent burning period to about 5 minutes. (See also Sprinkler System, page 31). A

late development has been the occasional appearance of an explosive variety, which may be guarded against by using shelter for the first 3 minutes, after which control efforts may be advantageously applied. See Appendix, (page 32).

Magnesium. — See Incendiary, above.

Time. — High explosive bomb with fuse set for a considerably delayed explosion. They may go so deeply into the soil, when landing in the open, that they cannot be seen, and must be excavated if removal must be undertaken before the explosion.

BOTTLE-NECK. — See Plant Bottlenecks (page 25).

CAMOUFLAGE. — Exterior disguise (by paint, special cover, etc.) to conceal plants, etc., from photographic or direct observation: usually applied for daylight use. The process is one calling for specific technical treatment and is likely to be a matter for Government instructions. For night periods, Blackout (see page13) will probably be depended upon. Recent careful studies in artificial light camouflage lead to the conclusion that adoption of such methods is unlikely.

CHIEF AIR RAID WARDEN. — In the community, the head of the Air Raid Defense organization. His office is usually at the Report Center. He has 3 lines of contact with the Plant Defense Headquarters: First, he transmits the official Warnings; second, he receives reports of bombs landing within the plant; third, he receives calls for Services when conditions are beyond the control of the plant organization, and if possible dispatches help to the plant. (See also Plant Warden, page 28).

COMMUNICATIONS. — Problems of disruption of the public communications systems are the charge of the Utilities or other departments maintaining them. Plants have, however, in many cases considered the setting up of emergency methods, as Short Wave Radio, etc. All such systems, when reaching outside the plant limits, are subject to official sanction and control. (See also Plant Communication, page 25).

CONCUSSION. — See Bomb, High Explosive (page 15).

COORDINATOR. — Official of Civilian Defense at the District Warning Center, (see below), Generally corresponding to

Chief AR Warden but dealing chiefly with Inter-Report Center relations, as on requests for emergency services from one community to the aid of another.

DANGER ALARM. — See Air Raid Alarm (page 12).

DECONTAMINATION. — The work of a special Chemical Service Squad, in cleaning up an area which has been bombed with gas. While chemical plants may organize such a squad, it is proable that for most plants this service would if needed be dispatched by the Report Center.

DEFENSE COUNCIL. — A committee (State, Local) which has the responsibility for the Civilian Defense Work of the area under its charge. Local Councils operate under general instruction from the State Council, which in turn is under direction of the First Defense Coordinator District, which is directly under the Federal Office of Civilian Defense. (See also Plant Defense Council, page 26).

DEMOLITION. — The work of a special Engineering Service Squad, in dealing with collapsed buildings (as for rescue of people caught therein) and in tearing down dangerous walls, etc., left in unstable condition. (See Mobile Corps, page 23).

DEPUTY WARDENS. — Persons appointed as Alternates or Assistants to Air Raid Wardens. (See page 8).

DISTRICT WARNING CENTER. — One of a number of locations in the State which act as the contact point between the (Army) Information Center and the local Report Center. It is in charge of a Coordinator, who will relate one Report Center with another, within its district, when emergency services from one area are needed by another area.

EMERGENCY INSPECTION. — See (page 26).

EMERGENCY REPAIR. — See Mobile Corps (page 23).

EMPLOYEE INSTRUCTION. — The fullest cooperation of all employees is necessary in dealing with conditions of Air Raid emergency, and this can be assured only by a preliminary process of general plant education. For this, House Organs, Bulletin Boards, and Pay Envelope Notices can be effectively used; but these

may be supplemented, or substituted for, by general plant assemblies or direct mail instruction.* Instruction may well include reference to Sabotage (see page 30) and should name the departmental leaders to whom employees should look for direction, as for evacuation of their room, etc. See, in this connection, Panic (page 24).

EMPLOYEE MOVEMENT. — From the plant point of view, evacuation means the moving of groups of employees from danger areas to safer areas.

The following general principles are suggested:

1. **On Public Danger Signal,** get all employees who are out in the open under cover of buildings. If at end of shift, arrange that temporary shelter be continued within doors. It is, as a rule, not practicable to evacuate employees to their homes.

2. **Bombs** - Two principal considerations are presented; first, incendiary bombs coming through roofs, and second; blast effects of explosive bombs landing in plant yards near working buildings. For the first, many plants consider the evacuation, on "alert", of work rooms which are directly under roofs or wooden attics, by moving the people to a floor below. For the second, a similar provision could be made for evacuation from ground floor to a floor above. Plans for such movements should be drawn with particular reference to avoiding congestion on stairways and with alternative routes set up in cases of blockage of stairs, halls, etc.

3. **Machine or Bench Cover** — Both with respect to flying glass and as protection from falling material, plants may adopt the precaution of directing that people lie beneath or close to the bench or machine where they work.

4. **Gas** — Any room with closed doors and windows should offer adequate temporary shelter from gas, provided that forced ventilating systems do not bring it in. Especially above the ground level, gas bombs outside of buildings are not dangerous. See Gas Attacks (page 19).

ENGINEERING SERVICE. — A general term applied to such groups as Utility men, City Street or Water Dept. men, etc., in details which clear up after explosive bombs. A Demolition Squad (See page 17) may be a part of this service. For Plants, see Mobile Corps (page 23).

*Attention is called to the press clipping in this regard, printed on back cover.

EQUIPMENT — Each plant will determine this in the light of its own conditions. On the last page of the booklet "Protection of Industrial Plants and Public Buildings," issued by the Office of Civilian Defense, a comprehensive list is suggested.

ESSENTIAL LIGHTING — Particularly for stairs, exits, and places of difficult access or dangerous equipment, it is important that special illumination be available in case of failure of the regular lighting system or in case Blackout invalidates the ordinary lighting circuit. Methods of providing emergency light vary; special circuits, storage batteries, and luminous paint are to be considered. It is important that toilet windows be blacked out, so that light may be on there at all times. The Blackout Code of the State Blackout Committee gives specification as to permissible lights during Blackout.

EVACUATION — See Employee Movement (page 18).

FIRST AID — In Air Raid Defense, the ministering to injured people before regular Medical Service is at hand. Its chief problems are: (a) Treatment for shock; (b) Artificial resuscitation; (c) Checking of severe hemorrhage; (d) preventing further injury of fractured parts when it is necessary to move the patient. The American Red Cross has developed a special 10-hour Course in First Aid. This is valuable and every plant department should have in it persons (1 to 10) who are so trained. A First Aid unit, available on call, would greatly strengthen the Medical Service of the plant. This can effectively be discussed and provided for by classes, through the auspices of the local Industrial Protection Committee or the local Red Cross. First Aid Kits should be located at several available locations within the plant. Unless there is a well-established plant hospital to give emergency care, it would be wise to set up one or more First Aid Stations, with cots, supplies, etc., to receive and serve injured persons until the City Medical Service can handle their cases.

FIRST DEFENSE DISTRICT — Substantially all of New England is included in one district (First) for Civilian Defense coordination. See Defense Council (page 17).

GAS ATTACKS — The discharge from a gas bomb of a liquid material which volatilizes and creates serious biological effects, - as by chocking, irritating the outer or inner surfaces of the body, causing violent nausea, or tear-blinding the eyes. Gas

has not, thus far, been used in the European area of this war. There appear to be two reasons for this; One, the fear of reprisals and the other, the great difficulty of effecting a compensatory result against an adequate defense. There is, however, a considerable chance that gas may be used, and in America, before the end of the war. Gas Defense, therefore, is an important consideration. Such defense includes, mainly, Shelter, Gas mask, and Decontamination. In the matter of Shelter, it is believed that any enclosed room or building with doors and windows closed will be adequate even on ground floor. Gases used are generally heavier than air, so that floors above the first are likely to be immune except from a bomb directly penetrating into them. Gas masks will be specified, produced, and probably distributed through government agency. They are chiefly required for "fighting line" emergency crews. Decontamination is a job for a specially trained and chemically equipped squad. It would probably be set up as a community Service, operating within plant areas as well as without.

GLASS PROTECTION — Windows, and other glass panels must be considered from the angles not only of Blackout (see page 13) but also of Shelter (see page 30) under concussion from explosive bombs. With respect to shatter, four methods may be used: cross-taping, painting with adhesive coatings (either translucent or opaque), wire mesh guard, or shutters. No authoritative statement can be made as to the resistance of glass containing wire mesh. (See also Employee Movement, page 18).

Skylights are important problems in Blackout and, while probably not subject to concussion from the street, may possibly burst outward from vacuum effects and are directly exposed to metal fragments from the sky.

H. E. — A short term for High Explosive bomb. (See Bomb, High Explosive (page 15).

HIGH EXPLOSIVE — See Bomb, High Explosive (page 15).

INCENDIARY — A short term for Incendiary bomb or other combustion agent. See Bomb, Incendiary (page 15).

INDUSTRIAL PROTECTION COMMITTEE — Under local Defense Council, a group of delegates from industrial plants, meeting usually with Chief AR Warden and occasionally with the heads of Community Services, to consider special problems in plant defense, in First Aid instruction (see page 19) and in Plant

Defense Staff instruction (see page 27). Opportunity is offered in this committee to consider the various proprietary materials which are offered in the market for use in plant protection.

The Plant Defense Officer will find this a useful medium for arranging with Chief Air Raid Warden about receiving Warnings, transmitting reports and calling for help when needed: with local City Water Department and Utility authorities about interruptions and restoration of their services at the plant: with local Police and Fire authorities about methods of coordinating his plant practices with their own: and, if his plant is isolated in a community, in working out with the Chief Air Raid Warden special problems of community protection. (See Isolated Plants, page 22).

INDUSTRIAL PROBLEMS — See Plant Problems (page 24).

INDUSTRIAL WARDEN — This title is not to be regarded as prescribed. The title "Air Raid Warden" is of specific meaning and implies a definite and approved course of instruction successfully completed. Other terms are used at plants to suit their local preference: as Defense Coordinator, Defense Chairman, Defense Chief, as well as the already established terms of Fire Chief, Safety Chief, Personnel Officer, etc., when applicable. With respect to the term "Warden" as applied to the rank and file membership of the plant Air Raid Defense staff, however, attention is particularly called to the discussion of Staff Training on page 27.

INDUSTRIAL WARDEN SCHOOL — See Air Raid Warden Schools (page 13) and Staff Training (page 27).

INFORMATION CENTER — An Army headquarters, where all reports on sky observation are received, plotted, and made the basis of Warnings issued to the affected areas of that Army district. To this office will go, in due course, a report of every "incident" that happens within its area of control.

From the Information Center warnings are sent, within a minute, to one or more of the District Warning centers in Connecticut (see page 17). From there, it will be relayed, in a few seconds, to the Report Center in your community (see page 29). That warning can be relayed to your plant. Such reports will indicate the presence of enemy craft about 100 miles away; then later, more urgently, the movement in your direction from, perhaps 50 miles away. These warnings are confidential and will be kept confidential when transmitted to your Plant. Plant precautions then taken should be done quietly and without general alarm.

When necessary, a general public alarm may follow, being sounded through the plant and the community, to predict a passage of the enemy plane overhead within 5 or 6 minutes. Plant readiness for attack should then take effect, not only in the defense organization but in the entire plant population. When the plane has passed beyond your area, a public "all clear" signal will be sounded, for a return to normal.

INSIDE COMMUNICATIONS — See Plant Communications, (page 25).

INSIGNIA — Sleeve or other designating marks to indicate that the wearer is a Civilian Defense worker, as in Air Raid Defense. For Air Raid Wardens, the insignia is established by the Office of Civilian Defense and is awarded only on authorization of the State Defense Council under instruction of the Coordinator of the First Defense District. (See Staff Training, page 27).

Similar restrictions prevail with respect to other defense staffs, as Auxiliary Fire and Police, etc.

Industrial plants may devise their own insignia for workers not entitled to the official insignia, but this may not infringe upon the official form. In such cases, it is advised that the legend include the name or initials of the Company.

The State Department of Motor Vehicles has ruled that windshield stickers may not be used and that nothing may be attached to the marker plates. Placards for windows are permissible, when authorized by the local Chief Air Raid Warden, for use in emergency only.

INSPECTION — See Plant Problems (page 24).

ISOLATED PLANTS — In a large number of instances, plants are individually (or in very small individual groups) the principal establishment in their communities, which have developed and grown up around them. In such cases, the plant is more than the economic mainstay of the community; it is the supplier of public services, and its personnel are likely to be a considerable part of the civil establishment. Such communities are, in a sense, wards of the industry; and the organization of Air Raid defense involves a close inter-relation between the community wardens and the plant emergency staff. For fire service, perhaps for police service, and frequently for medical service (as First Aid and emergency care), the plant puts itself at the service of the community about it.

While such communities, however, "industrial" in character, are not large enough to require the formation of an Industrial Protection Committee as distinct from an intra-plant defense committee, yet the problem of Air Raid defense requires a full consideration of the issues presented above. If plant representatives are already on the local Defense Council, or if a plant man is already appointed as Chief Air Raid Warden, then the Defense Council itself is well adapted to act as committee to study these matters. If not, it may be practicable in certain cases to enlarge the plant's own Defense Council by the addition of a Community representative.

LIGHTING PROBLEMS — See Essential Lighting (page 19).

MEDICAL UNIT — The corps of trained doctors and nurses who take over the treatment of the injured. Ambulance staff and Stretcher bearers may be members of this unit. For Plant Service, see First Aid (page 19).

MOBILE CORPS — A term applied to the Engineering Service when it is organized in form for quick movement to a point of need. For a plant of some size, such a corps should include Carpenter, Electrician, Pipe-fitter, Millwright, and possibly Oxy-Acetylene operator. The immediate function of the corps is to save life and prevent further destruction to plant. For permanent repair, it is understood that the usual construction or contractor force will take over in the usual routine.

MONITOR — Name applied by some plants to employees appointed as "N. C. O." to assume leadership of groups of employees who must be conducted or otherwise directed in non-routine action in time of emergency. Other titles would be Leader, Lieutenant, Defense Guard, etc. These should be selected with care, trained in all detail as to use of primary and alternative exits, and made known to the employee groups they are to be in charge of.

OBSERVATION POSTS — Operating on 24 hour service are sky-watchers, covering each area of 8 square miles in the state and covering also its coastal and other borders, who report any detected aircraft to (Army) Information Center (see page 21), at Boston or New York. These reports, when checked against information already at hand, are the basis of the Warnings (see page 32) sent to the several District Warning Centers in the state (see page 17).

OFFICE OF CIVILIAN DEFENSE — A governmental agency, under direction of Dean James M. Landis, created "to assure effective coordination of Federal relations with State and local government engaged in defense activities, to provide for necessary cooperation with State and local government in respect to measures for adequate protection of the civilian population in emergency periods, to facilitate constructive civilian participation in the defense program, and to sustain national morale."

PANIC — The hysterical loss of self-control, usually of a group of people. Its likelihood of occurrence is in direct relation to (a) the number of people in group, (b) the suddenness of the surprise shock, (c) the strangeness or unexpectedness of the occurrence. Its prevention is best achieved by (a) the advance instruction of the group, in anticipation of the occurrence, (b) the advance assignment to each person in the group of a specific action to be taken in the event of such occurrence, and (c) the calm and confident bearing of the leader, monitor, or other person in command.

As this constitutes the greatest probable plant hazard at time of Air Raid, there should be instituted an early campaign of prevention along the following lines:

1. Instruct all employees beforehand, explaining that careful plans are made for the protection of all, that advance notice will be received for the defense staff, that means are provided for essential lighting, and that group leaders will direct any movement that may be found advisable.

2. If action is to be recommended in the way of taking cover under benches, etc., this should be tried in at least one practice test.

3. See that the group leaders are people capable of maintaining a courageous and confident attitude in time of stress. This will not only facilitate their work as leaders but also have a contagious effect upon the group. See Monitors (page 23) and Employee Instruction (page 17).

PLANT PROBLEMS — In addition to the topics listed below, attention should be given to Action under Air Raid (page 12), Air Raid Damage (page 12), Blackout (page 13), Bombs (page 14), Camouflage (page 16), Employee Instruction (page 17), Employee Movement (page 18), Glass Protection (page 20), Industrial Protection Committee (page 20), Industrial Warden (page 21), Insignia (page 22), Isolated Plants (page 22), Mobile

Corps (page 23), Monitors (page 23), Panic (page 24), Report Form (page 29), Sabotage (page 30), Shelter (page 30), Sprinkler System (page 31), and Watchers (page 32).

Plant Bottlenecks: Many plants have certain operations dependent upon a limited group of special machinery and skilled operators, replaceable only with difficulty and delay. The especial protection of these "bottlenecks" - both from air raid damage and from sabotage - is a prime necessity in the defense plan. The same is true of special stores of material and such critical elements of control as switchboards, etc. (See Plant Survey, below).

Plant Communication: During an "alert" warning of Air Raid, it is vital that certain lines of the plant telephone system be kept absolutely open and clear for use between the office of the Plant Defense Officer and

(a) the Report Center

(b) the Offices of Plant Fire, Police, Medical and Mobile Corps.

(c) The posts of the Defense staff, where "incidents" may arise and require immediate report and, perhaps, call for help.

By prearrangement such telephone lines may be denied to ordinary plant use after the first advance (confidential) warning has been received from the Report Center. On the same account, it is important that alternative means of communication be available in case of failure of the phone system by broken circuit or by disabling of the central switchboard. (See Plant Signals, below).

Company Time: — For members of plant Defense Staff, some preparatory work will be required on Company Time, — as for organizational meetings, tests, etc. Beyond that, practice may vary between plants, depending usually on whether the instruction is done during working hours. The following is reported by the Wage & Hour Division of the U. S. Dept. of Labor (Bulletin, Vol. II, No. 9, Nov. 1941):

"Time spent by employees on defense plant air raid protection training programs which are not restricted to the hazards of the job at hand or to the personal responsibilities of employees in doing their job safely and efficiently will not be considered

hours worked, provided participation in the program is voluntary on the part of the employees and the training takes place outside the regular workday."

Plant Defense Council: — This committee or Council should consist of - at least - The Plant Defense Officer (see Industrial Warden, page 21,) and his Deputies (see page 8); the Chief of the Guard Dept.; the Fire Chief; the Chief of the Maintenance Dept.; and a leader in First Aid. Other valuable members would include Power Chief, Electrician, and Traffic head. This council will be the advisory body for the plant Defense Officer in his plant survey, defense plan, and selection and training of staff.

Plant Defense Officer: See Plant Warden, below.

Plant Defense Plan: See outline of Plant Defense Officer's duties (page 6).

Plant Defense Staff: The Plant Defense Officer should discuss the matter of Volunteer Aid with the Management, in the light of the considerations under "Plant Volunteers" below. The following general principles have been found valuable as guides to successful organization:

1. Selection of Key Men is to be determined more by personal characteristics of the appointee than by his specific training.

2. No appointee to a responsible duty in time of emergency should be held to any other duty which will demand his attention at that time.

3. People having direct contact with employees, at time of crisis, should be selected with an eye to their standing in the esteem of their fellows. Women should be considered for leadership of women groups.

4. No volunteer should be rejected, even though it may be necessary to create some special duty, adapted to his particular characteristics, to which he may be assigned.

Plant Emergency Inspection: The importance of this is indicated under Blackout (see page 13), Plant Operational Breakdown, below, and Sabotage (see page 30).

Plant Operational Break-Down: Plants in defense production are in danger of break-down in their operational routine due to extra stresses and overloads. Experience has shown that:

(a) New processes, new materials, new machines, new workers, all present problems of unfamiliarity which may induce unexpected dangers.

(b) Overloads on established lines, circuits and machines may exceed the safe limits. Especially for tools and fixtures, the increase in operation exceeds the capacity for keeping them in A-1 condition.

(c) Speed-up and congestion will increase the chances of accident.

(d) Unusual burdens upon supervisory staffs lead to oversight and unintentional neglect, predisposing the plant to fire and accident hazards due to poor "housekeeping."

Emphasis should be placed upon increased Inspection Staffs. Sabotage and Enemy Agent may be expected to operate against efficiency of production. This calls for more frequent and more rigorous inspections, especially against fire risks, explosion hazards, and mishandled valves, and particularly during Blackout.

In providing against these hazards every plant will find some facilities already at hand, both in the existing organization and trained ability of its employees and in the equipment found in the plant. To the extent that these facilities are complete and adequate, they will decrease the demand upon services of the community and this may prove essential in emergencies calling for all or more immediate Services than the Community can supply.

Plant Signals — War Department or other regulations may restrict the use of whistles or sirens or, at least, prohibit the use of certain signals for other than a fixed set of meanings. The use of plant horns, bells, light signals, annunciators, radios, or in the last resort runners, should be discussed with the public authorities and may well be considered in conferences of the Industrial Protection Committee. (See Communications, page 16, and plant Communication, above).

Plant Staff Training — The Plant Defense staff, when selected and assigned to stations and duties, may become entitled to Air Raid Warden Certificate and Official Insignia upon completion of a course of training which is prescribed in Subject and amount by

the Office of Civilian Defense. (See Air Raid Warden Schools, page 13). It is designed to develop Warden capacity in community as well as factory situations, and it carries with it the further requirement of at least 10 hours of instruction in First Aid. The Air Raid Warden course may be set up through the local Industrial Protection Committee and in consultation with the State Defense Council.

Plant Survey: See outline of duties of Plant Defense officer (page 6). Special attention should be given to inflammable and explosive stores at the plant.

Plant Volunteers: Management has, of course, the selection, appointment and direction of its Plant Defense Officer. (See Industrial Warden, page 21). Under its direction, he should make such plant surveys, lay out such plans for Air Raid defense, and recommend such forms of staff organization, as seem necessary. But in the selection of personnel to man the Defense staffs, it is recommended that the volunteer system be exclusively depended upon. That is to say, "frontier line" work in time of Air Raid should be, - under sanction of Management and with the complete approval, selection, and training by the Plant Defense Council, - a purely volunteer job on the part of those employees who have enlisted for such service during the period of their regular employment shift. When summoned by the "alert" to the emergency service, they still preserve their employee status on the time clock and are entitled to all the normal rights and earnings of their regular jobs. Their status upon the Company's books will remain unchanged. Management will, as always, have the right to recognize such special service, after the emergency, in any way that seems suitable. However, as volunteers in plant defense, the workers do not alter the status or classification in which they stand as regular employees of the company.

Plant Warden: The appointed head of plant defense, who plans and organizes the defense program and leads in directing its instruction, practice tests, and actual performance. He is the point of contact between the plant and the Report Center in the Community. (See Industrial Warden, page 21).

Plant Warnings: One of the first duties of the Plant Defense officer is to arrange with the local Chief Air Raid Warden for the receipt of the Warning Signals upon their transmittal through the Report Center. How this will be done - whether by direct telephone

line between the Report Center and the Plant or by indirect though immediate transmittal by a functioning staff set up by the local Industrial Protection Committee or in some other way — will depend upon the local situation in each community and upon the plan approved by the local Chief Air Raid Warden.

PUBLIC SIGNALS: See Air Raid Alarm (page 12).

RAIDER: Hostile Aircraft with bombs. See Air Raid Damage (page 12).

RED: An official Warning, the third in the series, shown at the Report Center by a red light, to indicate the expected presence of a raider overhead within a very short time. It is the occasion for a public alarm signal both in the plant and throughout the community, — a series of short blasts or, by bells a continuous peal.

REPORT CENTER: An office, of which there will be at least one in each of the 169 Townships of the State, which serves as the directing or coordinating center for its community in time of Air Raid. It receives Warnings from the District Warning Center (See page 17) and relays them to the Defense staffs of the industrial and other precincts of its area. It receives report from all parts of its area when any bomb falls. It is usually in charge of the Chief Air Raid Warden, who is supplemented by directing representatives of the Police, Fire, and other established Services of the Community served by it. It is the one point of recourse when call must be made for such Services, and it is the source from which they are sent out to all points of need.

REPORT FORM: A printed blank used in both reporting and receiving an immediate record of a bombing incident. Within the plant, particularly for subsequent verifications, it is important that any report of an "incident" be a matter of exact record. For this, a printed form should be provided*. A recommended procedure for its use is as follows:

(a) When a Watcher reports a bombing to the Plant Defense Headquarters by phone, he should follow the order of report shown on his form. As he makes each statement, he should write it on the form, and preserve this sheet for future filing at the Plant Defense Headquarters.

*An official form has been set up for Community Air Raid Wardens. The plant form, if not the same as this, should exactly follow its general order and arrangement. This will greatly assist the Report Center.

(b) At the Plant Defense Headquarters, as the report is received over the phone, each statement should be entered upon an identical form as fast as received. This should be done in duplicate, by use of carbon, and should be time-stamped as soon as made.

(c) If contact is not made by phone, the Watcher should at once fill out and send his report form by messenger.

(d) The carbon duplicate at the Defense Headquarters should be forwarded in due course to the Report Center, being anticipated by a phone report as soon as time is available. The first duty of the Defense Headquarters is to notify the plant Services to bring aid to the place affected. Where such services must be obtained from outside the plant, then the call to the Report Center should be **made immediately;** and the report form sent by messenger, to confirm.

SABOTAGE: (See also Plant Operational Breakdown, page 27). As this and similar acts of Enemy Agents may imperil life as well as property, the rank and file of employees, as well as the Guard and Inspection Staffs, should be cautioned to observe and promptly report any suspicious incidents or changes in their areas, particularly of recent occurence. Inspection should be made frequently of critical points in the plant (stores, valves, control systems, etc.) and especially in night periods. At time of Danger Alarm (see page 12) and Blackout (see page 13) especial vigilance is recommended. (See also Plant Bottlenecks, page 25).

SHELTER: Any protection from the effects of bombing, as from gas, or falling metal, or lateral blasts of air, or flying fragments of bombs, glass, or other material. In this connection, the importance of Plant "Bottlenecks" should be considered. (See page 25).

In general, the principle of concentration in shelters will, in this country, be avoided in favor of a general plan of dispersion. In plants, however, concentration will necessarily exist. Except for direct hits by bombs, it is probable that plant buildings will in themselves be shelters sufficient for most needs. (Respecting "direct hits", see Bomb, High Explosive, page 15). The first important move in time of "alert" is to get people out from the open and under cover. This is to avoid metal fragments from the skies. The remaining important issue is the protection of people from flying glass. (See Employee Movement, page 18 and Glass Protection, page 20. In the matter of Gas, see Gas Attack, page 19).

SIGNALS — See Air Raid Alarm (page 12) and Plant Signals (page 27).

SPOTTERS — A term applied to those who man Observation Posts (see page 23) for report to (Army) Information Center (page 21). On this account, it is less desirable for the term to be applied to plant look-outs, and for these the title of Watcher (see page 32) is recommended.

SPRINKLER SYSTEM — Water in the form of spray or discharge from automatic sprinklers is the most effective medium for controlling fires from the usual 2-pound magnesium incendiary bomb. This is proved by English experience* and confirmed by laboratory tests here.

Each sprinkler is an "automatic fire spotter." When a bomb lands and starts a fire, the heat soon opens a sprinkler. The resulting deluge quickly extinguishes, or at least controls the fire around the bomb; also hastens the burning of the bomb itself so that within 5 or 6 minutes it becomes a harmless heap of ash. The first requirement is to see that sprinklers are well supplied with water, with all valves kept wide open. Since explosive bombs beyond the plant limits may disrupt public water supplies, independent secondary supplies protected against disruption are a desirable safeguard.

STAFF TRAINING — See Air Raid Warden Schools (page 13 and Plant Staff Training, (page 27).

TRAINING — See Air Raid Warden Schools (page 13) and Plant Staff Training, (page 27).

*The following is condensed from a report of the findings of the Fire Offices Committee, Testing Station, Hertfordshire, England: It has been found both by experimental work and practical experience that sprinklers can deal effectively with incendiary bombs and the fires caused thereby. If connected with alarm system the operation of the sprinklers will draw attention to the presence of incendiary bombs which may not have been detected by watchers. Stop Valves must not be fitted on the installation side of the main valve except for odd ranges of sprinklers in cartways and other exposed positions. In certain cases where trunk mains feed numerous installations, stop valves may, however, be advantageous, as such valves may enable some of the installations to be kept operative notwithstanding damage to the main in another part of the premises. It is required that the pipes comprising a sprinkler installation be used only for feeding the sprinklers or testing the alarm: and no connection may be made to any of these pipes for any other purpose, such as feeding jets, sprays, or taps. Where high explosives have damaged a building without causing fire, a certain amount of water damage has been done through fractured sprinkler pipes, but in the majority of cases it is doubtful whether this damage has added materially to that done by the bomb itself.

VOLUNTEERS — See Plant Volunteers (page 28) and Plant Defense Staff (page 26).

WARNINGS — See Air Raid Alarm (page 12).

WATCHER — A roof watcher, who sights and at once reports any bomb (as an Incendiary) falling within the plant, or any other plant damage from Air Raid. (See Spotter, page 31, and Report Form, page 29). See Appendix, below.

WHITE — An official Warning, shown at Report Center by a White light, indicating "All Clear" (see page 13).

YELLOW — An official Warning, the first in the series, shown at Report Center (see page 29) by a Yellow light, giving a confidential intimation of the existence of hostile aircraft which may direct its flight over the area. Should this prove to be the case, there will follow a "Blue" Warning (See page 14). If the aircraft takes another direction, the next, and final, warning will be the "White" (see above), indicating "All Clear" (see page 13).

APPENDIX

English Industrial Plants in Incendiary Raids.

The following is presented (Factory Mutual Record, February, 1942) as the outstanding conclusions given by the Chief of the London, England, Fire Brigade as to the protection of industrial plants from incendiary raids:

(1) "The need of a well-developed and adequate organization of roof-spotters (watchers) or guards constantly available day and night, with additional men to cover all floors in the course of a raid. . ."

(2) The need of small squads of fire fighters, trained to protect the property without the help of the public fire department, and available on immediate notice at any time of day or night. . ."

(3) "The need (against disrupted water service) of providing auxiliary water storage and pumps, such as gasoline-motor driven units. . ."

New York Times
December 30, 1941

FACTORY RAID RULES STRESS 'KEEP COOL'

OCD Publishes Instructions for Workers in Industry

Special to THE NEW YORK TIMES

WASHINGTON, Dec. 29—Twelve rules in which "keep cool" was repeated twice were presented today by the Office of Civilian Defense for the benefit of workers in industrial plants during an air raid. These instructions were:

Keep working until our air raid alarm is sounded.

Take cover.

Keep cool.

Don't phone or shout—listen to your air raid warden.

If you have a plant defense post, take that position at the sound of the alarm.

Others continue their usual tasks until the air raid wardens give the signal to take temporary shelter.

Take the necessary safety measures for your machine and tools.

Do not show lights.

Fight incendiary bombs. Conflagrations are avoided by controlling such bombs at once.

Remain "alert" in the prescribed safe place until the "all clear" signal is given and then return to work.

Remember that this is a war of production and that production must continue. Your plant is taking every precaution for your safety.

Keep cool and help others to keep cool.