

WASC 2347

MR W. J. Wright
Factory Rules
& Miscellaneous
Notes

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RULES
OF THE
ROYAL
GUNPOWDER FACTORY,
WALTHAM ABBEY.

1934.

General Instructions and Definitions.

1. The following Rules have been drawn up with a view to the due regulation of the Royal Gunpowder Factory, and to the prevention of accidents.

2. Any infringement of Rules will render the offender liable to suspension or dismissal.

3. The expression "Factory workman" in these Rules includes any man or boy, of whatever rank or position, employed in the Factory under the Superintendent.

4. The word "workman" in these Rules, includes any man or boy, of whatever rank or position, employed in the Factory by the Building Works Department, or by Contractors, and also includes a "Factory workman."

5. The expression "Danger Building" means any building or part thereof, in which any process of the manufacture of explosives is carried on, or in which any packages, or ingredients, or any explosives, either in any stage of manufacture or in the finished state, are kept. The expression also includes boats and trucks used for the conveyance of explosives and their ingredients in any stage of manufacture.

6. The word "clean" as applied to buildings, boats, trucks, platforms, clothing, etc., means that such buildings, etc., are reserved exclusively for use in work on and in connection with explosives.

The word "dirty" is to be taken as the converse of "clean," as defined above.

7. Every Factory workman on joining the Factory will be provided with a copy of these Rules, as well as with a copy of the Rules and Regulations of the Ordnance Factories which they supplement. These copies are to be kept in good order and produced when required.

8. Every Factory workman is to make himself thoroughly acquainted with *all* Rules which concern his employment. Ignorance of Rules will not be accepted as an excuse for their non-observance or contravention.

9. The General and Special Rules are to be read to Factory workmen as laid down. All who are responsible for reading Rules are to sign the prescribed certificate before leaving the Factory.

10. Every Factory workman is at once to report to his Chargeman, or to superior authority, any infringement of Rules which comes to his notice.

R.G.P.F. RULES.—AMENDMENT APPROVED OCTOBER, 1940.

GENERAL INSTRUCTIONS AND DEFINITIONS.

Delete paragraphs 3 and 4, and substitute the following :—

3. The expression "Factory workman" in these Rules includes any person, of whatever rank or position, employed in the Factory under the Superintendent.

4. The word "workman" in these Rules includes any person, of whatever rank or position, employed in the Factory by the Building Works Department, or by Contractors, and also includes a "Factory workman."

Delete Rules 3 and 3A, and substitute the following :—

RULE 3.

Any workman, other than those provided for in Rule 2, found inside the Factory with matches or other means of striking or procuring a light, with tobacco in any form, with tobacco pipes or any other appliance for smoking, or with chemicals or any other dangerous article will be at once expelled from the Factory and not allowed to re-enter without permission of the Superintendent. A Factory workman will be temporarily suspended from work, and, if a previous breach of this rule is recorded against him, he may be discharged; any other workman may be permanently forbidden to re-enter the Factory.

A breach of this rule entails liability to prosecution.

Should a workman or other person inadvertently bring any prohibited article inside the Factory and deliver it up himself at once, and certainly before passing into a building, etc., containing explosives, he will suffer no penalty, provided he is not in the habit of making this most undesirable mistake.

The person to whom the article is delivered will at once report the case, and a note will be made of the occurrence.

Medicines are not to be brought into the Factory except by permission in writing, which will only be granted on production of a medical certificate.

8. Every Factory workman is to make himself thoroughly acquainted with the Rules and Regulations of the Factory. Ignorance of the Rules and Regulations is no excuse for non-observance.

9. The Rules and Regulations of the Factory.

10. E. Chargemen Rules w.

General Rules.

1.

No one is to smoke in any part of the Factory.

2.

No matches of any kind, or other means of striking or procuring a light, are to be used in the Factory except by workmen, duly authorised in writing, who are responsible for their safe custody and employment.

No fire or light, other than those for which standing authority is given, will be lighted except on the written authority of the Officer in charge of Danger Buildings who will specify the place in which the fire is to be lighted, the hours during which it may be kept alight, and the person responsible for lighting and extinguishing it.

Workmen in Danger Building clothes are not to approach any fire or gas or other open flame.

3.

Any workman, other than those provided for in Rule 2, found inside the Factory with matches or other means of striking or procuring a light, with tobacco in any form, with tobacco pipes or any other appliance for smoking, or with chemicals or any other dangerous article, if he is a Factory workman will be at once discharged. Any other workman will be at once removed and not allowed to re-enter the Factory.

Medicines are not to be brought into the Factory except by permission in writing which will only be granted on production of a medical certificate.

3A.

Should a workman or other person inadvertently bring any prohibited articles inside the Factory and deliver it up himself *at once*, and certainly before passing into a building, etc., containing explosives he will suffer no penalty, provided he is not in the habit of making this most undesirable mistake.

The person to whom the article is delivered will at once report the case, and a note will be made of the occurrence.

Any person, however, who *knowingly* introduces any forbidden article will be discharged.

4.

No workman under the influence of liquor will be allowed to enter the Factory.

Any workman discovered to be under the influence of liquor when inside the Factory, if he is a Factory workman will be at once discharged. Any other workman will be at once removed and not allowed to re-enter the Factory.

No beer, wine, or spirits are to be brought into the Factory without the written permission of the Superintendent.

5.

No workman, unless authorised by the Superintendent, is to enter or leave the Factory except by the main entrance in Powder Mill Lane, or by the entrance in the Sewardstone Road.

Workmen having keys of the Factory gates are only to use them for themselves when on duty.

No Factory workman under the rank of Chemist, or Principal Foreman, is to leave the Factory at any but his authorised time without a pass duly signed.

No Factory workman below the rank of Chemist-in-Charge or Principal Foreman is to sign passes out "on duty" except under exceptional circumstances, when a Foreman or the Assistant Foreman of the shift is to do so.

Passes out "without pay" are not to be signed by anyone below the rank of Assistant Foreman.

6.

Workmen below the rank of Assistant Foreman, on entering and leaving the Factory and the Danger Building Enclosures, must submit to be searched, and must allow any bag, basket, or parcel of any kind they may be carrying, to be examined by the Police, Warders, or other authorised persons.

7.

(a) All Factory workmen except those of the Machinery, Plumbers, Labour, and Store Sections, and those employed in offices, are to proceed at once from the entrance gates to the appointed Shifting Rooms, where they are to change their own clothes for the clothes provided. Workmen are to take every precaution to prevent "clean" clothing from becoming contaminated with dirt or grit.

(b) All Factory clothes are to be marked with the number of the workman to whom they are issued.

(c) Factory clothes are not to be altered in any way.

(d) Trousers and sleeves of Danger Building clothes and underclothes are not to be turned up, except by men working in the Guncotton Nitrating House and Pulping and Moulding Room who are permitted to turn up their sleeves, but must turn them down before leaving the buildings.

(e) No loose article, other than a handkerchief, is to be taken into a Danger Building.

(f) Pockets are not allowed in any garments worn with Danger Building clothes.

(g) Workmen in Danger Building clothes are not to carry or wear any articles of, or containing iron, steel or metal, without the Superintendent's authority. All buttons on private underclothes are to be of bone.

No man of the productive sections is to enter a Danger Building wearing glasses unless authorised in writing by the Superintendent. In the case of men authorised to wear them for booking purposes only, they are only to be worn while booking is actually being done and when not in use are to be kept in the leather pocket provided for that purpose.

(h) Jackets are always to be worn completely fastened up in all Danger Buildings, except in Guncotton and Cordite Stoves, Paste Mixing Houses, Box Houses, Cotton Picking, Teasing and Drying Rooms and Guncotton Vat House. Caps and Jackets will be put on, and Jackets fastened up before leaving the buildings.

(i) The great coats provided are not to be worn or hung up inside the clean barriers of Danger Buildings.

(j) Factory clothes are to be taken off and left in the Shifting Rooms, or other appointed places, before the workmen leave the Factory.

(k) No Factory Clothes are to be taken or worn outside the Factory, except in the case of Bargemen, Firemen, Messengers, Water-warders, Warders, and Motor Wagon Drivers.

(l) All workmen who change into Danger Building clothes are prohibited from coming to work in any under garments made of "flannelette."

Any workman disobeying this rule will not be permitted to proceed to work, and will be liable to punishment for disobedience of orders.

Flannelette is a cotton fabric, and when new has one or both sides with a raised pile surface.

To assist workmen in identifying flannelette, samples of this material, of flannel, and of cotton and flannel mixtures can be seen on application to the workmen's foreman.

Workmen are warned that some flannelettes are chemically treated and appear to be non-inflammable when new, but that after washing they become inflammable.

(m) Workmen who are permitted under sub-section (i) of this rule to work in Danger Buildings without jackets, must wear *flannel* shirts.

(n) Men working in acids or dangerous corrosive liquids where there is a risk of personal injury from splashes or otherwise will wear goggles and gloves unless otherwise ordered by a foreman or higher authority. Gloves will be collected at the end of the day's work by the Chargeman, and will be examined and washed before being again issued.

(o) No wood, explosive article, or inflammable substance is ever to be allowed to come within six inches of steam pipes or boilers, and the closest watch will be kept that this precaution is observed.

(p) Grass in the vicinity of buildings containing explosives should never be allowed to become long. After cutting it should never be allowed to lie unduly long before removal. If for any unavoidable reason the grass should have been allowed to grow to any serious length, or if after cutting, it has been allowed to lie for some time, it must, in dry weather, be well soaked with water in the immediate neighbourhood of magazines, or buildings containing explosives, at the close of work for the day.

(q) Direct sunlight must not be allowed to fall upon explosives.

(r) All belts on machines should be covered by a guard.

8.

(a) All workmen are to scrape their boots on the scrapers, and wipe them on the mats, before entering the Shoe Rooms, porches, or entrances of Danger Buildings.

(b) Workmen working in Danger Buildings are to take the shoes provided with them to the Danger Buildings, and are to put them on before entering the Danger Buildings on the shoe boards in the Shoe Rooms or porches, or at the "clean" barriers, leaving their own boots or shoes in the appointed places. A similar procedure is to be observed in changing back into their own boots.

Danger Building shoes are not at any time to be deposited in any place where they can come in contact with dirt or grit.

The shoe boards are to be kept "clean," and folded back except when actually in use.

(c) Boots worn in Cordite Stoves are not to be used in any other building.

(d) "Clean" shoes issued to Millmen for use when oiling and cleaning the mill cross-heads are to be kept on the shelves in the mill cabins.

(e) "Clean" overboots placed in the Gunpowder Mill Magazines for the use of Millmen are not to be removed.

9.

The overboots for the use of Officials in Danger Buildings are not to be worn by workmen below the rank of Assistant Foreman. They are to be kept on the "clean" side of the barriers, or in the "clean" cupboards provided.

They are to be put on and taken off on the "dirty" side of the barrier on the "clean" boards provided.

Anyone wearing overboots is to have the bottoms of his trousers down and tucked inside the overboots.

10.

Sticks and umbrellas are not to be taken into Danger Buildings.

11.

After having changed into Danger Building or other clothes, workmen are to assemble outside the Shifting Rooms and are to proceed in gangs under their respective Chargemen to the Dining Rooms, taking with them their food baskets and drink cans. These baskets and cans are to be searched in the Dining Rooms as the workmen enter, and are then to be left in the Dining Rooms.

On leaving the Dining Rooms, the workmen are to proceed in gangs under their respective Chargemen to the danger or other buildings in which they work. There is to be no loitering and skylarking in proceeding to and from the Danger and other buildings.

On the cessation of work, similar arrangements to the above are to be observed.

All who are responsible for searching are to sign the prescribed certificate before leaving the Factory.

On pay days silence is to be observed in the vicinity of, and at the pay table.

12.

Workmen proceeding from place to place in the Factory are to follow the roads, paths, and waterways prescribed.

Workmen are not to cross over or stand on any bridge when explosives boats are passing underneath it.

13.

All Danger Building workmen are to be thoroughly searched by the Chargeman under whom they work immediately before beginning work at the commencement of the shift, after meals, and after absence from the Danger Building from any other cause.

Danger Building shoes are to be examined by the Chargemen before they are put on at the commencement of the shift.

Workmen who change into non-Danger Building clothes, or who do not change at all, will be thoroughly searched by their Chargemen before proceeding to work.

Workmen of Service Sections will be thoroughly searched by the Foreman or Chargeman of the shop before proceeding to work in the Danger Building.

The Chargeman of the Danger Building in which repairs are carried out will thoroughly search all workmen of Service Sections before entering the building.

In the case of men wearing their own clothing the search will include the complete turning out of all pockets. The fact that this search has been carried out will be recorded on a Search Certificate which will be kept in the Danger Building concerned while the men are at work.

Each individual workman will be held responsible for reporting to the appropriate person in order to be searched before commencing work in any Danger Building.

The Chargemen are to be searched by the Assistant Foreman of their shift.

All who are responsible for searching are to sign the prescribed certificate before leaving the Factory.

14.

No workman is to enter any part of the Factory, or any Danger Building in which he is not employed.

No Factory workman is to leave any building in which he is working without the permission of the Chargeman.

No workman is to enter the Shifting Rooms, or the Dining Rooms, except at the appointed meal hours, during his working hours without a pass signed by the Assistant Foreman or senior Chargeman of the shift.

No Factory workman is to leave the Dining Room before the expiration of his meal time, or to enter any building during his meal time, without the authority of his Chargeman.

Work is to be continued until the authorised time for leaving the Danger and other buildings.

15.

Meals are only to be taken in the appointed Dining Rooms at the appointed times except by Engine Drivers and Stokers, who are to take their meals in the Engine and Boiler Houses.

16.

Before commencing work in any Danger Building, all doors are to be unlocked and unbolted, the keys hung up on the hooks provided, and the bolts withdrawn and placed in the loops, or secured back by means of the pins provided. Chargemen are responsible that this is done.

Doors when not locked are to be either closed or fastened back. All keys are to be removed from the locks as soon as the doors are unlocked or locked.

Nothing is to be placed in front of doors or windows whilst work is going on.

Doors of all other buildings are to be unlocked and unbolted whilst the buildings are in use.

When not in use all Danger and other buildings are to be kept locked up.

17.

Before commencing work, Chargemen are to inspect their respective Danger Buildings and plant, and are to report at once anything found damaged or out of order to their Assistant Foreman, or to superior authority.

18.

The Chargeman of each Danger Building is responsible that the limits posted up at the Danger Building for the number of workmen, and for the quantities of explosives, are always strictly adhered to.

No one is to approach or carry out work of any nature without authority in the vicinity of Danger Buildings in which work is going on.

19.

No tools, implements, or movable articles of any kind are to be used in any Danger Building, except those provided and entered on the "Use List" posted up at the building. All such tools, implements, and articles are to be marked with the name and number of the Danger Building to which they belong, and from which they are not to be removed without

authority. When not in use they are to be deposited in the appointed places in the Danger Buildings.

Tools for cleaning Guncotton Stoves and Nitro-glycerine Houses are not entered on the Use Lists of these buildings. They are only to be taken in when the buildings have been freed from explosives, for cleaning out.

Consumable stores not on the Use Lists, such as sponge cloths, chalk, oil, lubricants, etc., are to be used as economically as possible. Only one layer of chalk is to be kept in the chalk rests.

Pieces of chalk, pencils, and similar articles are not to be placed behind the ear.

20.

Chargemen are to keep all hand fire pumps and fire buckets filled with clean water and ready for use. These are not to be removed from the positions assigned to them, nor used for any but fire purposes.

Chargemen are to see that in frosty weather fire buckets are kept free from ice.

Drenching tanks are to be kept filled with clean water.

21.

Workmen are not to interfere with anything in the Factory, such as tram lines and points, buildings and their fittings, plant, machinery, tools, implements, and materials, either in course of manufacture or manufactured, except in the fulfilment of their duty.

22.

Workmen employed in Danger Buildings are to carry on their work in as gentle and careful a manner as possible. No greater force is to be employed than is absolutely needed to effect the object in view under normal conditions. Should any operation whatever appear to require the employment of unusual force, it is to be at once suspended and a report made to superior authority.

All tools and implements are to be used with the greatest care; all movements of the nature of blows or friction are to be avoided. Tools and implements are never to be thrown down, or allowed to fall or drop on the floor.

Clothing is not to be shaken out in a Danger Building with the object of removing dry guncotton or paste.

Workmen handling drums containing, or which have contained, Acetone, Alcohol, Ether, Benzol, Naphtha, or any

other inflammable liquid, will make themselves acquainted with the special rules relating to that work.

Workmen are forbidden to carry out experiments in Danger Buildings or with explosives.

Workmen are immediately to check, both in themselves or others, any tendency towards trifling, skylarking, carelessness, or the employment of undue force in their work.

Whistling, singing, or making noises of any description, is not allowed.

Spitting in any place where workmen congregate is forbidden.

23.

Receptacles of all kinds, including cordite reels and trays and packages for explosives, whether full or empty, are not to be roughly handled or dropped. They are to be lifted clear from place to place; they are not to be pushed, slid, dragged along, or sharply put down.

Bags containing explosives are to be securely tied up for conveyance by boat or truck.

Barrels containing explosives are to be rolled on the chine each one separately, except headed-up barrels of gunpowder which are to be rolled on the bilge. Open barrels are not to be placed one inside the other. Bags containing dry guncotton or paste are to be wiped over with a dry cloth to remove guncotton dust before loading into a boat or truck.

All receptacles and packages provided with covers are to be kept covered. Covers of all kinds are to be put on and taken off with care.

Receptacles and packages, whether full or empty, are not to be allowed to stand in the sun.

All packages are to be examined for cleanliness and freedom from foreign substances before explosives are put into them.

Should any foreign substance be found in the contents of any package containing explosives, the package and its contents are to be put on one side, and an immediate report made to the Chargeman, and by him to superior authority.

Bags will be turned inside out for examination.

23A.

All explosives are to be kept covered except when work is being carried out upon them.

Empty packages are not to be stored in magazines.

24.

The clean platforms, and the floors and interiors of Danger Buildings, boats and trucks, as well as the plant and machines, are to be kept perfectly free from dirt and grit, and from all accumulations of explosives and of unnecessary materials. Any water spilled on to asphalt and lead floors, is to be mopped up at once to prevent the chance of workmen slipping.

In Gunpowder Danger Buildings, the floor is to be kept wet, when barrels or cases containing gunpowder in any stage of manufacture, are being loaded into, or unloaded from boats.

The clean wood platforms are to be constantly wetted, especially in hot, dry, and windy weather.

In Nitro-glycerine Danger Buildings, every care is to be taken to prevent nitro-glycerine escaping from the apparatus. Should any be spilled, it is to be immediately wiped up with a damp cloth.

25.

In the event of the accidental upsetting or spilling of explosives on tram lines, platforms, or "dirty" places generally, the Chargeman or superior authority is to be informed at once, and no attempt is to be made to clear up the explosives until someone in authority arrives to superintend.

26.

Sponge cloths and cotton waste which have been used with oil or turpentine are not to be taken into any building in the Factory, or kept in it, except for immediate use, and upon the cessation of such use they are to be removed to the iron cupboards provided outside the buildings. These sponge cloths and cotton waste are to be removed from the cupboards to the receptacles provided, as follows:—In the case of buildings working day-work, single-shifts, or two shifts, at the end of the day's work; in the case of buildings working three shifts, when no longer serviceable and at the end of the week's work. The receptacles are situated as follows:—

Upper Works.—Between main Fire Station and Stores Office.

Quinton Hill.—East side of General Stores.

Cob Mead and Cob Field.—Outside Dining and Shifting Room.

27.

The red danger signals are to be displayed when the machinery is at work in any Gunpowder Danger Building, and in the Blank Cutting House, and no boat or truck containing explosives is to approach within the red boundary posts until the machinery has been stopped and the signal lowered.

The red signal is to be displayed when the loading of a cordite incorporating machine is going on, and when no traverse intervenes no truck or workman is to approach nearer than the centre bay of the adjacent half group, or than the red posts or marks.

A red flag is to be displayed when a guncotton stove is being unloaded, and work in the stove is to stop whilst a boat containing explosives is passing.

28.

Workmen are immediately to report to their Chargeman, or to superior authority, anything which they may observe unusual or apparently dangerous in the operations, in the plant, machinery, tools and implements, or in the appearance of the materials with which they are working, or in the acts or conduct of their fellow workmen.

Should the plant or machinery in any Danger Building appear out of order, or should anything go wrong with it, the operation or machine is to be stopped at once and an immediate report made to superior authority. Work is not to be resumed without the permission of Chemist-in-charge or Principal Foreman.

29.

Neither alterations or repairs to Danger Buildings, nor alterations, repairs, or adjustments to plant or machinery in them, are to be carried out; nor on the completion of such alterations, repairs, or adjustments, is work to be resumed until the Special Rules in connection with alterations, repairs and adjustments, have been complied with.

Danger Building workmen are not to carry out any alterations or repairs, however trivial, to Danger Buildings, plant, machinery, tools or implements.

30.

Driving-belts are not to be put on or taken off pulleys on either shafting or machinery, nor is overhead shafting to be lubricated or adjusted by any but the authorised workmen.

If a ladder is employed, it is to be held by another man ; boys are not to hold ladders.

31.

All Danger Buildings and their machinery are to be examined periodically under the direction of the Officer-in-charge of Danger Buildings.

32.

On the cessation of work daily, charcoal, whether ground or unground, is to be removed to the Charcoal Store, and all gunpowder in any stage of manufacture is to be removed from the boats to the magazines.

On cessation of work for the week, all gunpowder in any stage of manufacture is to be removed from Danger Buildings to the Magazines.

This rule does not, however, apply to Incorporating Mills, the Stove and the Blending House.

The Chargemen are to sign the prescribed certificate daily before leaving the Factory.

On Saturdays, the buildings and machines are to be thoroughly swept and cleaned out, and the leather floors washed.

When it is necessary to remove any gunpowder incrustations, whether from the machinery or floors, which cannot be easily brushed off, they are to be removed by means of water, supplemented if necessary when the whole of the incrustation has been thoroughly saturated, by a suitable wooden implement gently applied.

33.

When the operations of pre-washing and washing nitro-glycerine are finished for the day, the plant is to be thoroughly washed down.

On the cessation of nitro-glycerine making for the week, the whole of the plant and apparatus is to be thoroughly cleaned and freed from nitro-glycerine. When this has been done the Foreman Plumber, accompanied by the Chemist-in-charge and the Assistant Foreman on duty, is to make a thorough inspection of the whole of the plant and apparatus, and all defects are to be repaired and everything put into working order, before the manufacture of nitro-glycerine is resumed.

Condemned nitro-glycerine and guncotton plant and apparatus is to be cleaned under the direction of the Chemist-in-charge, before it is destroyed.

34.

In the Cordite Section, all buildings and machines are to be thoroughly cleaned on the cessation of work for the week.

All cordite is to be removed from the Press Houses, and from the Reeling House, except that in closed boxes or barrels, or on drums and reels actually in use on the drumming and reeling machines.

35.

No plank or gangway, other than that provided for the purpose, shall be placed across or inside any uncovered vessel containing acid, hot water, or any other dangerous substance.

36.

No spades, scrapers or pails made of iron or any other metal are to be used in cleaning out or removing residues from any still, tank or other vessel which has contained sulphuric acid or other substance which may cause evolution of arseniuretted hydrogen.

37.

Before any person enters, for any purpose except that of rescue, any boiler, flue, still, tank or tower, or any other place where there is reason to apprehend the presence of dangerous gas or fume, the Head of the section concerned, or some responsible person under his direction, shall personally examine such place, and shall certify in writing, in a book kept for that purpose, either :—

1. That such place is isolated and sealed from every source of such gas or fume and is free from danger, or
2. That it is not so isolated and free from danger.

No person shall enter such place if certified not to be isolated and free from danger unless he is wearing a breathing apparatus and (where there are no cross-stays or obstructions likely to cause entanglement) a life-belt, the free end of the rope attached to which shall be left with a man outside, whose sole duty shall be to keep watch and to draw out the wearer if he appears to be affected by gas or fume. The belt and rope shall be so adjusted and worn that the wearer can be drawn up head foremost through any manhole or opening.

No person shall enter any such place for the purpose of rescue unless he is wearing a breathing apparatus and life belt as above-mentioned.

38.

In the Acid Factories when any work of an unusual nature has to be done which is in any way likely to result in the evolution of nitrous fumes, the Chemist-in-charge is to be present whilst it is carried out, or he is, at his discretion, to detail the Foreman or Assistant Foreman to be present and is to furnish him with written instructions for the performance of the work.

Should at any time anything unusual happen during ordinary routine work, whereby a workman is exposed to nitrous fumes, or should a workman in the performance of his ordinary duty feel the effects of nitrous fumes, he is to immediately report the fact to his Chargeman, who is to inform the Assistant Foreman or superior authority. The workman is to be treated in the manner laid down in the cautionary Notice against Gassing, posted at the First Aid Boxes.

39.

No machines in the Factory are to be cleaned, nor are the safety guards to be removed whilst the machines are in motion. Machines and plant in the Cordite Section, are however, to be wiped over, as laid down in the respective working instructions.

40.

On the approach of a thunderstorm the machinery in all Danger Buildings is to be stopped, and all doors and windows are to be closed and boats tied up. The Factory workmen are to retire to the Dining Rooms until the storm has passed over and orders are given to return to work.

Should, however, the Manager or Chemist-in-charge consider it unsafe or impracticable to suspend any process in hand, such men only as are necessary for its continuance are to remain at work.

During a thunderstorm telephones are not to be used.

41.

No workman below the rank of Chargeman is to turn the electric light switches on or off.

Should anything go wrong with the electric lights an immediate report is to be made to the Assistant Foreman of the shift, or to superior authority.

Electric lights which go out are not to be replaced till next morning, unless they are absolutely necessary; if this is the

case, the electric light of the particular building is to be switched off before the defective lamp is replaced by the Assistant Foreman of the shift.

In Gunpowder mills, during shifts on which no Assistant Foreman is on duty, the defective lamp will be replaced by the senior Millman.

42.

Workmen are not to interfere with the wires, lamps or anything connected with the electric or gas lighting or heating apparatus or fires.

Gas burners and fittings throughout the Factory are not to be used for any but the authorised purposes.

43.

Except where otherwise specified, the temperature in buildings heated by steam is to be kept as closely as possible to the following:—

- (a) In workshops and danger buildings, 13° C. (55° F.).
- (b) In offices, stores, shifting and dining rooms, 16° C. (61° F.).

The chargeman or senior employee in each building will be held responsible that these temperatures are maintained when steam heating is in use.

Steam is to be regulated by means of the inlet valves; the outlet valves are always to be kept fully open.

The head of the section concerned is to be informed when steam is shut off from any building.

Nothing is to be placed on or near steam pipes, and every care is to be taken to prevent explosives getting on to them.

Workmen are not to interfere with steam traps.

44.

For opening and closing lock gates, the ropes and chains provided are to be used. The hand rails are not to be used for these purposes, and the ropes are to be first cast off from the hooks. When done with, the ropes are to be recoiled and replaced clear of the water, on the hooks.

Lower gates of locks are not to be closed by opening the upper slackers and allowing a rush of water through the lock.

Boat poles are not to be used in the puddled cuts.

All boats passing up and down the Mill Head stream are to keep outside the hoods of the guncotton Stoves.

45.

Chargemen are not to leave on the suspension or cessation of work, until the windows, shutters, and doors of their Danger Buildings have all been fastened and bolted, all outer doors locked, and all lights put out.

They are responsible that no workmen remain in Danger Buildings, that all is left correct, and that the keys are deposited in the appointed places.

46.

Apparatus operated by internal combustion engines is not to be used within 30 yards of any building containing explosives without the specific approval of the Superintendent in writing in each case. Boats containing such apparatus are not to approach within 30 yards of any boat containing explosive until the engine has been stopped.

Special Rules.

Repairs, Alterations, Adjustments, Inspections.

When repairs, alterations, adjustments, or inspections, to, or in a Danger Building have to be carried out, the following procedure is to be observed :—

1.—Except as hereinafter mentioned, all explosives are to be removed and the building, plant, and machines are to be thoroughly cleaned out by washing or otherwise, under the supervision of a Visitor of Danger Buildings, or, in the case of the Nitro-glycerine Section, of the Chemist-in-charge.

In the case of minor repairs and adjustments to Rifle Cordite Presses and Reeling Machines, only the particular machine needing repair or adjustment need be cleaned. The Head of the Cordite Section will decide what is a minor repair for the purpose of this rule.

2.—The Visitor of Danger Buildings having satisfied himself that all is safe for the work to proceed, is to report to that effect to the head of the section.

3.—In the case of work on buildings, the head of the Section is to inform the Clerk of Works, Building Works Department, that the Building is ready.

4.—In the case of work on plant or machines, the head of the Section is to direct the Foreman of Machinery, or of Plumbers to proceed.

5.—During the whole time work is going on to, or in a Danger Building, a Danger Building workman is to be present to keep everything " clean " and to remove or thoroughly wet any explosives which may come to light.

This rule does not apply in the case of buildings which have contained cordite or wet gun cotton.

6.—On the completion of the work, the building, plant, and machines are to be thoroughly cleaned out under supervision of a Visitor of Danger Buildings, or, in the case of the Nitro-glycerine Section, of the Chemist-in-charge.

7.—The Visitor of Danger Buildings having satisfied himself that everything is in a fit condition for work to be resumed, is to report to that effect to the head of the Section.

8.—The head of the Section is then to order work to be resumed, and is to report finally to the Officer-in-charge of Danger Buildings.

9.—In the case of inspections, the head of the Section is to notify the results to the Officer-in-charge of Danger Buildings.

10.—For the purpose of carrying out work of any kind in Gunpowder Danger Buildings, metal tools only are to be used as a rule. If steel or iron tools are necessary, special authority for their use is to be obtained through the Officer-in-charge of Danger Buildings.

In the Cordite Section, no tools or implements of iron, steel or metal are to be used for cleaning plant or machines.

Shifting Rooms.

The Caretakers are responsible for the observance of the following Special Rules. The Chargemen are to assist them in supervising the workmen.

1.—Order, decorum, and cleanliness are to be maintained in the Shifting Rooms. The Caretaker is to report any workman causing a disturbance, or guilty of any irregularity.

2.—“Clean” clothes are to be kept in the receptacles provided and no other article is to be put therein.

3.—When any article requires drying, the fact is to be reported to the Caretaker.

4.—No workman is to enter the Shifting Room during his working hours on any pretence whatever, unless provided with a pass signed by the Assistant Foreman of the shift, or by superior authority.

5.—Any workman who leaves his work, or attempts to enter the Shifting Room before the time approved for the Section or group of men in which he works, is to be reported.

Dining Rooms.

1.—The Caretakers are responsible for the observance of the following Special Rules. The Chargemen are to assist them in supervising the workmen.

2.—Order, decorum, and cleanliness are to be maintained in the Dining Rooms. The Caretaker is to report any workman causing a disturbance, or guilty of any irregularity.

3.—In each Dining Room a table or tables are to be set apart for workmen not in Danger Building clothes.

4.—No tea-leaves, paper, or other refuse are to be thrown or left about the Dining Rooms or in their vicinity; anything of the sort is to be put into the receptacle provided, and burnt by the Caretaker.

5.—No clothes of any description are to be hung up to dry in the Dining Rooms.

6.—“Clean” shoes taken to the Dining Rooms are to be placed on the “clean” shelves provided.

7.—No workman is to enter the Dining Rooms during his working hours on any pretence whatever, unless provided with a pass signed by the Assistant Foreman of the shift, or superior authority.

Engine Drivers and Stokers.

1.—On change of shift, incoming Engine Drivers are to satisfy themselves that everything connected with the engines is correct.

Stokers are to take note of the height of water in the boilers and to satisfy themselves that the feed valves and safety valves and everything connected with the boilers are in correct order.

2.—Engine Drivers and Stokers are not to enter any Danger Building nor allow workmen to enter the Engine Rooms and Boiler Houses with the sole exception of Gun-cotton Stove Chargemen who enter the Stove Engine Houses to record temperatures.

3.—Stokers are to make themselves thoroughly acquainted with the printed “Advice to Boiler Attendants,” which is hung up in every Boiler House.

4.—The Chargeman of the boiler cleaning gang is responsible, that before a workman goes into a boiler for cleaning it, the stop valves and blow-off cocks are padlocked.

5.—Stokers are always to have their boots or shoes laced up tight, in order to prevent hot ashes, etc., getting in between the boot or shoe and the foot.

6.—Engine Drivers and Stokers are not to give lights, or means of procuring a light, to anyone except the Fireman.

Engine Drivers and Stokers who receive written orders to light the fires are to do so themselves.

Danger Building Visitors.

The "Danger Building Visitors" are directly under the Inspector of Danger Buildings, Royal Arsenal, Woolwich, to whom they will report, and from whom they will receive instructions.

(1) They are constantly to visit all Danger Buildings and Houses, including those of the Nitroglycerine Section, where work is going on, at uncertain periods during their tour of duty to ascertain:—

- (a) That the work is carried on in a satisfactory manner and in strict accordance with the General and Special Rules.
- (b) That the "limits" laid down for the amount of explosives, and the number of workmen, are being strictly adhered to.
- (c) That the machines are in good working order.
- (d) That the workmen are correctly dressed.

(2) They are occasionally to visit and examine all Danger Buildings, Houses and Shops not in actual use.

(3) They are to see that no sponge-cloths or cotton waste which have been used for oil or turpentine are left in Danger or other buildings not in actual use. An immediate report is to be made to the Inspector of Danger Buildings should any be found.

(4) They are frequently to examine all Boats and Boat Houses.

(5) They are frequently to check and examine the tools and implements enumerated on the Use Lists of all Danger and other buildings, and see that none other than those authorised are in use.

(6) They are to examine all Danger Buildings, machinery and plant, except in the Nitroglycerine Section, before and after repairs, alterations, adjustments, or inspections, as laid down in the Special Rules.

(7) They are frequently to search the Chargeman and workmen in all Danger and other buildings where work is

going on. A record of this will be entered in the book kept for the purpose.

When searching men dressed in Danger Building clothing they will carefully examine to see whether any unauthorised alterations or additions have been made in the clothing (*see* General Rule 7 (e) and (f)), and that only underclothing of the correct material is worn (*see* General Rule 7 (b)).

(8) They are also authorised to search, for matches and other prohibited articles, all persons they may meet on their rounds.

(9) They are to make an immediate report of any unusual occurrence to the Inspector of Danger Buildings. *They have no discretionary power whatever to overlook offences.*

They will also bring to his notice any matter connected with Danger Buildings, appliances, fittings and lighting which is thought to require consideration or attention.

Should any accident take place or anything be out of order in a Danger Building, they are authorised to stop the work at once.

(10) A diary is to be kept in each Danger Building, House and Shop, in which they are to record the hour of their visits, and all details in connection with them.

(11) They will render a weekly report to the Inspector of Danger Buildings on the prescribed form. In this will be recorded:—

- (1) the passing of Danger Buildings as "clean" which they have carried out;
- (2) the names and numbers of men searched;
- (3) any irregularities.

(12) They will not give any instructions to workmen except in case of urgent necessity; but if they think it desirable, will draw the Chargeman's *personal* attention to any matter they may consider needs amendment or alteration. This will in no way cancel the order to report the matter also to the Inspector of Danger Buildings.

Warders.

The Warders are directly under the Officer-in-Charge of Danger Buildings, to whom they are to render all reports. Their duties are to search:—

- (a) All Factory workmen below the rank of Assistant Foreman, unaccompanied by a Chargeman.

- (b) All machinery workmen.
- (c) All Workmen belonging to the Building Works Department, or to Contractors.
- (d) Not less than 10 per cent. of all other workmen in gangs.

Watchmen.

1.—The Factory is divided into five areas as indicated on the maps issued to the Watchmen. Each Watchman is to be in possession of a map of the area patrolled by him.

2.—Each Watchman will be responsible for one area, and will patrol it during his tour of duty.

3.—Watchmen will be responsible that no unauthorised person enters their area, and that no person enters it by any but the recognised means of access.

4.—They will challenge all persons whom they may suspect to have no business in their area, and if not satisfied will detain them and report the circumstances to the Officer-in-charge of Danger Buildings.

5.—They may search all workmen below the rank of Assistant Foreman. In the event of any contraband articles being discovered they will take possession of them and report the facts to the Officer-in-charge of Danger Buildings.

6.—The Watchman in charge of No. 1 Area will be responsible that no person, except those on the Nitro-glycerine List, enters the Nitro-glycerine Enclosure, and that the gates to the Enclosure are kept locked.

7.—The Watchman in charge of No. 2 Area will open the Refinery Gate at 11.45 a.m. and will admit all patients attending to see the Medical Officer. He will remain on the gate until the Medical Officer and all patients have left the Factory and will then lock it and resume his patrol.

He is responsible that no contraband articles are brought into the Factory by any person admitted by him.

8.—The Watchman in charge of No. 4 Area will attend at the Guncotton Gate when workmen are entering and leaving the Factory and will assist the Police in searching.

9.—Watchmen will satisfy themselves that all fires lit in their area, except at the authorised burning grounds, have been duly authorised by the Officer-in-charge of Danger Buildings.

10.—Watchmen will attend all Fire Drills which take place in their area during their round of duty, and will make themselves acquainted with the position of all hydrants and hose houses.

They will also qualify in First Aid as soon as possible after appointment, if not already in possession of a certificate.

11.—They will report anything unusual which may happen in their area, and will sign the report Book at the end of their tour of duty before leaving the Factory.

12.—The Officer-in-charge of Danger Buildings is in charge of the Watchmen and they will report direct to him.

Boats for Explosives.

The Chargeman, or when no Chargeman is present, the senior Boatman is responsible for the observance of the following Special Rules:—

1.—Boats are to be cleaned and examined before use; they are also to be examined for any leakage after loading.

2.—Boats containing explosives or their ingredients are not to be left unattended, except during a thunderstorm.

3.—The slides of Boats are to be shut, except when loading or unloading. The end doors are not to be left open.

4.—The leather pads and loading boards, where provided, are to be used when loading or unloading.

5.—The "clean" towing ropes are not to be used for mooring purposes. Boats are to be moored by passing the mooring ropes through the rings on the wayling, and securing them.

6.—Boats in motion are to be kept clear of the waylings and banks.

7.—Boat poles are not to be used in puddled cuts.

8.—The floors and platforms of all Gunpowder Danger Buildings are to be wetted before loading into and unloading from boats.

9.—Boatmen are to see that bags containing explosives are securely tied up before they are loaded into or unloaded from boats.

10.—Boats with explosives are not to approach, or be moored within the red boundary posts of any Danger Building displaying a red signal, until the signal has been lowered.

11.—Boats with explosives are not to approach, or be

moored within the red boundary posts while a boat is being loaded or unloaded under the hood at the lower Island.

12.—Boats either with explosives or empty are not to be taken under any bridge if anybody is standing on or crossing over the bridge.

13.—Boats with explosives are not to pass any barge or boat between the Lower Stores Yard crane and the entrance to the Lower Island Cut, until the boatmen have ascertained that there is no fire or light on board such barge or boat.

14.—Should a barge be passing through the water lying between the Hospital and the Lower Stores Yard crane, no boat with explosives is to enter that water until the barge has passed through, or has been moored so as to give a free passage.

15.—Boats with explosives are not to pass under the Refinery Bridge until the Chargeman has ascertained that no steam lorry or other dangerous traffic is in the vicinity.

16.—All boats passing up or down the Mill Head Stream are to keep outside the hoods of the Guncotton Stoves.

17.—When boats proceeding in opposite directions have to pass one another, the boat going up stream is to take the inside station.

18.—For opening and closing Lock gates, the ropes and chains provided are to be used. The hand rails are not to be used for these purposes, and the ropes are to be first cast off from the hooks. When done with, the ropes are to be recoiled and replaced clear of the water, on the hooks.

Lower gates of locks are not to be closed by opening the upper slackers and allowing a rush of water through the lock.

19.—The boats belonging to No. 2 Granulating House and No. 1 Breaking-down House, are to be moored inside their respective boat-houses, when their Danger Buildings are at work.

20.—On the cessation of work at the end of the shift, day, or week, boats are to be emptied and cleaned out, and moored at the places appointed.

Boats used for dry guncotton, or paste, are to be thoroughly washed out with a hose every six months.

21.—Boats containing explosives are not to approach within 30 yards of boats or other apparatus containing

internal combustion engines until such engines have been stopped.

Trucks.

All workmen using trucks are responsible for the observance of the following rules:—

1.—Explosive trucks are to be cleaned out and examined before use.

2.—The doors of explosive trucks are to be kept closed, except when loading or unloading.

3.—Open trucks, and trucks with loose flaps, are to be covered over, and the covers or flaps securely fastened, when the trucks are in use.

4.—Trucks containing explosives or their ingredients are not to be left unattended, except during a thunderstorm.

5.—Bags containing explosives are to be placed in trucks with their mouths inwards. Truckmen are to see that bags containing explosives are securely tied up before putting them into or removing them from trucks.

6.—Cases, barrels, boxes, and bags are not to project beyond the sides of the truck.

7.—When loading open trucks, the bottoms of cases and boxes, and the centres of barrels on the top tier, are not to be above the top of the truck ends.

8.—Workmen pushing trucks are not to go beyond a walk.

9.—Workmen must never let go of trucks when in motion.

10.—Workmen are not to sit or ride on any trucks.

11.—Trucks are not to be pulled or drawn from the front, they are to be pushed from behind, except only when it is necessary to pull them clear of porches, etc.

12.—Empty trucks are always to give way to loaded ones.

13.—All trucks at Quinton Hill are to make way for the red trucks containing dry guncotton.

If a truck containing dry guncotton or paste runs off the line, the Assistant Foreman, or superior authority, is to be informed at once, and no attempt is to be made to replace the truck on the line until someone in authority arrives to superintend. The dry guncotton, or paste, is to be removed from the derailed truck *before* attempting to replace the truck on the line.

14.—Trucks containing explosives are not to approach within the red boundary posts of Danger Buildings displaying a red signal or red light, until the signal is lowered.

Paste trucks delivering paste at Incorporating Houses are to stand close up against the stops on the sidings. Paste is only to be delivered through the openings in the traverses opposite the centres of these houses.

Dough may be removed from, and Mineral Jelly and Acetone may be delivered to Incorporating Houses through any of the openings in the traverses, provided General Rule 27 as to red signals is observed.

15.—Trucks are to be clear of points before the points are moved.

16.—Branch line points are to be altered after use, so that there is a clear course for traffic on the main lines.

17.—Trucks are not to be left standing on main lines.

18.—Trucks are never to be left standing unless the brake is full on.

19.—Trucks are not to be left standing over any points or in any position where they are liable to be fouled by a truck travelling on another line.

20.—On cessation of work at the end of the shift, day, or week, trucks are to be emptied and cleaned out, and left at the places appointed.

21.—Trucks used for dry guncotton, or paste, are to be thoroughly washed, inside and outside, with wetted cloths on the cessation of work for the week.

Rules for the Protection of the Railway.

1.—Workmen and others must be careful not to throw any waste material on to the railway, and must not place obstructions over-hanging the railway walls between the swing bridges at Great Hoppit and Lovatt's Mead.

2.—If any Department finds it necessary at any time to place planks or other obstructions across the rails, the same should be properly protected by red flags by day and red lights by night. It is the duty of the Chargeman to remove these obstructions when work is finished.

No planks or other obstructions are to be left nearer than two feet to the nearest rail.

3.—Ropes for tying up boats are not to be placed across the railway in any circumstances whatever.

Fire Rules.

1.—On the alarm of fire, all available hydrants in the vicinity of the fire are to be got to work at once by the men of the regular detachments.

2.—Should the hydrants not be available, or the supply of water be insufficient, all available engines are to be at once conveyed to the scene of fire.

3.—If both hydrants and engines are at work, the men of the regular detachments not required on the hydrants are to take the more important places on the engines, the handles being worked by untrained men.

4.—When it is necessary to employ the engines in a situation where the suction pipes cannot be used, water is to be supplied to the engines by means of buckets.

5.—To keep up a continuous supply of water to the engine, two lines are to be formed of the nearest available workmen, about six feet apart. The full buckets are then to be passed up one line to the engine, and the empty returned by the other line to the water.

6.—The senior Factory workman is to take charge until the arrival of an Officer of the Factory or a Fireman.

7.—The Police are to be at once informed of the fire, and are not to allow any persons who are not connected with the Factory to enter the grounds. They will inform the Hospital that a fire alarm has been given.

8.—Should the fire take place at night, the Police will immediately inform the Officers of the Factory, the Fireman, and the Hospital.

9.—The regular detachments are to be drilled by the senior Fireman once a month.

10.—The closest attention is to be paid by all to the instructions given at fire drills, and each man is to be thoroughly acquainted with all the duties of the detachment.

R. C. BOWDEN,
Supt., R.G.F.

December, 1934.

First Aid Regulations.

1.—First Aid boxes are to be kept in the following buildings :—

Foreman's Office, Cordite Upper.

N/G Office.

Main Laboratory.

Machinery Shop, Upper.

Guncotton Office.

Asst. Foreman's Office, Guncotton.

Machinery Shop, Lower.

Carpenters' Shop.

Boxes will also be kept in the following buildings when they are opened for work :—

Acetone Recovery.

Cordite Office, Quinton Hill.

2.—A list of the authorised contents will be kept in each box.

3.—Each box will be in the charge of the Head of the Section in which it is situated and a book will be kept in which is to be recorded any withdrawals and the purpose for which used.

4.—A certificate will be rendered monthly to the Superintendent that the boxes are fully stocked and in good order.

5.—In addition to the above, an emergency dressing will be kept in each hose house throughout the factory. These will be in the charge of the Head of the Section in which they are situated who will inspect them monthly and report any deficiencies.

The removal of any of these dressings must be reported to the Foreman, who will arrange replacement.

6.—Stretchers, smoke helmets and life lines are stationed as under :—

Building No.		No. of Stretchers.	Smoke Helmets.	Life belt and lines.
5	Police Hut, Fishers Green	1	—	—
38B	Hose House, N/G.. .. .	2	1	1
83A	Acid Shifting Room, Edmondsey .. .	3	—	—
91A	Fire Engine House, G.C. Stoves .. .	1	—	—
95B	Fire Engine House, C.E. Still House ..	1	—	—
96	Dining Room, C.E.	1	—	—
151	Fire Engine House, near No. 3 Incorporating House	2	—	—
138	Hose House, near No. 6 Incorporating House	3	—	—
162	Hose House, near No. 4 Press House .. .	2	—	—
192A	Hose House, near No. 6 Press House .. .	2	1	1
216	Hose House, Great Hoppit	2	—	—
233	Main Fire Station	1	—	—
243	Main Shifting Room	1	—	—
259A	Hose House, near No. 10 Press House.. .	2	—	—
286A	Hose House, South of Hospital	1	—	—
388A	Fire Engine House, Lower Island .. .	2	—	—
451A	Fire Engine House, Guncotton Factory ..	3	1	1
431A	Foreman's Office, Guncotton Factory .. .	1	—	—
439	Shed near Police Box, Guncotton Gate ..	1	—	—
527A	Hose House, Cordite Shifting Room, Quinton Hill	3	—	—
621	Hose House, Reel Stoves, Cob Field .. .	1	—	—
561	Hose House, Magazine, Cob Field .. .	2	—	—
537	Hose House, Cob Mead	1	—	—
584	Hose House, Cob Mead	1	—	—
561A	Hose House, Cob Mead	1	—	—
599	Hose House, Cob Mead	1	—	—
570	Hose House, Acetone Recovery	1	—	—
508	Foreman's Office, Cordite Lower Wheeled Stretchers are stationed near the Offices at N/G and G/C.	1	—	—

First Aid Boxes.

Breathing Apparatus and Lifebelts.

Nitro-glycerine Office.

Guncotton Office.

Acetone Recovery.

Wright W J 322 010



RULES
AND
REGULATIONS
OF THE
Royal Ordnance
Factories

NINTH EDITION

1937

Issued to

Wright W.J.

on H. 2. 38.

SHOP No. 322 ~~010~~

YOUR IDENTIFICATION No.

is

6748

Please quote above Number,
also your Shop Number on
all Letters and Enquiries
relating to Wages, Sickness,
Absence, etc.

**RULES AND REGULATIONS OF THE ROYAL
ORDNANCE FACTORIES**

(NINTH EDITION)

These Rules, together with the Regulations promulgated in the Appendices, constitute the Rules and Regulations of the Royal Ordnance Factories (Ninth Edition).

They apply with any authorised modifications to all industrial employees at the R.O.F., at the R.D., at the S.E.E., or under the C.I.A., C.I.S.A., C.I.E.S.S., or the W.D. Chemist.

Employees are also subject to such special rules or conditions of employment as may be applicable to the grade or nature of their employment (e.g., Danger Building Regulations), as promulgated from time to time.

The Rules and Regulations are subject to any amendments made from time to time.

The rules governing entry are set forth on R.O.F. Form 23 which every applicant is required to complete before engagement.

SECTION I

GENERAL REGULATIONS

(1) **Working Hours.**—The ordinary Factory week consists of 47 hours of work. The local times of starting and stopping work are posted in the sections concerned and are subject to revision as necessary.

(2) **Day Rate Guarantee.**—Employees on systems of payment by results are guaranteed on a weekly basis their Day Rate for all time actually worked.

(3) **Waste of Time.**—Leaving the Shops without permission, idling or loitering render the offender liable to discharge.

(4) **Intoxicants.**—At factories in which intoxicants can be purchased they must be consumed on the Canteen premises. The introduction or consumption of intoxicants is otherwise strictly prohibited. Any employee breaking this rule or found intoxicated will be liable to discharge.

(5) **Secrecy.**—Special attention is called to the Official Secrets Acts. A summary of the Acts is posted on the official notice boards, and attention is especially drawn to Section 2, Subsection (c) of the Act of 1911 as amended by the Act of 1920.

Employees will report without delay any incident, wherever arising, which appears to indicate a breach of fidelity or discretion or to have any bearing on the security of the Naval, Military or Air Forces of the Crown, especially when a breach of the Official Secrets Acts is suspected.

An employee receiving any communication which may be construed as a solicitation to commit or abet any action which is or may be an offence against the Official Secrets Acts, or observing or becoming aware of any such action should report the matter forthwith.

No unauthorised communication of information to which access is obtained in the course of employment, whether such information is secret or not, will be made to any newspaper or to any person whether interested or not.

Employees are forbidden to make copies of, or extracts from, official documents, or to utilise such documents in any way for any private purpose or purpose other than the discharge of their official duties.

(6) **Unauthorised Work.**—Employees are forbidden to carry out in the Factories any work, however trifling (including manufacture or repair of articles for their own personal use), without duly authorised orders.

(7) **Smoking.**—(i) Smoking is prohibited throughout the Arsenal except in places where specially authorised, when the times will be as follows :—

	Shops.	Central Office.
Monday to Friday	Up to 4 p.m.	Up to 4 p.m.
Saturday or other short day	Up to 10 a.m.	Up to 11.30 a.m.

When overtime is worked, smoking in authorised places will be permitted up to 1½ hours from the time of ceasing work.

(ii) Employees smoking, except at authorised places, will be liable to dismissal. Cigarette ends, remains of tobacco from pipes, and used matches must be disposed of in such a way as not to be a menace to the safety of the buildings.

(iii) Any employee who may inadvertently bring smoking materials or means of procuring a light into shops where smoking is prohibited, should immediately deliver them up to his Foreman, otherwise he will render himself liable to suspension, or, on repetition of the offence, to discharge. Any employee found with such articles in Danger Buildings or in an explosives or filling factory will be dealt with under the Rules of these establishments.

(8) **Firearms, etc.**—Any employee in possession of firearms, or articles of an explosive nature, while within the precincts of a War Department Establishment, unless such have been issued to him in connection with his duties, will be liable to instant dismissal.

(9) **Theft.**—Misappropriation of Government property, however trivial, or the aiding or abetting thereof, will render the offender liable to prosecution and dismissal.

(10) **Abuse of Government Property.**—(i) Employees will be held responsible for the safe custody of any public property in their charge; and should such property be lost, wasted or damaged through negligence, carelessness, or wanton act, the employee concerned will be liable to such disciplinary action, including dismissal in serious cases, as the Head of the Department may direct. It will be within the discretion of the Head of the Establishment to accept a proposal from the employee concerned to refund the value of the property, in whole or part, in mitigation of the offence.

(ii) Before an employee is paid off on discharge he must return to the management all property of the Government, including tools and material, for which he is responsible.

(11) **Machines in Motion, etc.**—(i) Machines are not to be cleaned when in motion, and no near approach is to be made to shafting in motion.

(ii) Employees are strictly forbidden, under pain of dismissal, to remove or replace bands on main shafting, unless specially authorised by their Foreman.

When it is not possible to replace a belt in position by means of a pole, the shafting should be stopped, the belt tied to the pulley and moved into place by small movements of the motor, care being taken that all workmen are standing clear.

Belts are not to be left resting on revolving shafting, and ladders should not be placed or left in positions that give access to shafting in motion.

(iii) Employees neglecting to use any fencing or machinery guard provided for their safety are liable to dismissal and prosecution.

(12) Patents.—An employee is not permitted to apply for or obtain a patent for an invention except in the manner laid down in King's Regulations, 1935, App. XX, which can be seen on application.

(13) Complaints, etc.—Complaints or representations by employees must be made in a proper and respectful manner, and in the first place, to or through their Foreman, or through other recognised channels. Every employee has the right of appeal to the Head of the Department and ultimately to the Head of the Establishment.

(14) Various Offences.—(i) Unauthorised collections, trading, gambling, moneylending, betting, and forming lotteries and sweepstakes on War Department premises, whether during working hours or otherwise, are strictly prohibited. An employee offending in any of these respects, or by disorderly conduct on War Department premises, or guilty of any misconduct or convicted of any offence which in the opinion of the Head of the Department renders such disciplinary action desirable, will be liable to suspension or dismissal.

(ii) Employees are forbidden to keep or hold a licence for or in any way assist in conducting a public house or beer house, pawn shop or marine store dealer's shop, or bookmaking business. This rule is infringed when the business is conducted or, in the case of a licensed business, the licence is held by a member of the employee's family with whom he resides at the business premises.

(iii) The attention of all employees is specially drawn to the necessity for avoiding any form of financial speculation which might conceivably involve a conflict between their

private interests and their duty as public servants, or might expose themselves or their Department to public criticism. A statement of the principles which should regulate their conduct in relation to the public is contained in the Report of the Board of Enquiry appointed to investigate certain statements affecting Civil Servants (Cd. 3037, Feby. 1928) extracts from which are available for individual reference if required.

(15) Notices, Meetings, etc.—No signs, bills or notices may be displayed, nor meetings held within the Factory, except with the permission of the Head of the Establishment.

(16) Addresses.—Changes of address must be notified immediately to the Foreman.

(17) Transfers.—An employee desiring to make application for a transfer to another Department must first obtain the written permission of the Head of the Department in which he is serving.

(18) Non - Disciplinary Suspensions.—Employees are liable to suspension in the event of slackness of work, breakdown, lack of material, and for any other cause, which, in the opinion of the Head of the Department, will disturb continuity of work. For such periods of suspension no pay is issuable.

(19) Search, etc.—Employees are liable to be searched under Clause 6 of the Public Stores Act, 1875.

No tools or property, whether personal or public, may be taken out of the Factories without a property pass.

(20) Parliamentary Candidature.—Any employee who may become a Parliamentary Candidate is required to cease his employment when he issues his address to the electors or otherwise publicly announces himself to be a candidate, and he is required at the same time to tender his resignation provisionally (or in default is to be deemed to have done so), which resignation will become effective in the event of the candidature being successful. Where such candidature is not successful, the employee will be permitted at once to withdraw his resignation, when the period of absence from duty will be treated as absence on special leave without pay.

(21) **Bankruptcy.**—An employee who becomes a bankrupt or insolvent must, under pain of dismissal, at once report the fact.

(22) **Speed Limits, etc.**—Motor vehicles must not be driven and pedal cycles must not be ridden to the danger of other users of the roads, and in any case the speed must not exceed the limit authorised in the area concerned.

SECTION II DISCHARGE

(23) **Notice of Discharge.**—Except in cases of dismissal for misconduct, an employee whose services are no longer required will receive not less than one day's notice, and one day's notice is required from any employee wishing to leave.

(24) **Retirement for Age.**—The age at which an employee may retire or be retired is 60 years. At the discretion of the Head of the Department, however, he may be retained up to the age of 65 years, at which age retirement is compulsory.

(25) **Discharge, etc., of Boys.**—A boy, other than an apprentice, will not be retained after his seventeenth birthday, unless there is a vacancy for which he is suitable in an occupation that affords training that may be useful to him if he leaves Government employment. Such employment is terminable at any time. After attaining the age of 21 he may be retained if there is a suitable vacancy for an adult.

SECTION III PAYMENT OF WAGES

(26) (i) Employees will attend the pay table (where they will give up their signed clock cards or pay tickets in exchange for wages) in their numerical order of their respective shops.

(ii) If an employee is unable to attend the pay table he may apply to his Foreman for the proper form to authorise another person to draw his pay; but no person connected with the recording of time or make-up or payment of wages or distribution of pay tickets may draw for another employee.

(iii) Any error in the amount of pay must be brought to notice by the employee before he leaves the pay table. No subsequent claim will be entertained.

(iv) Unless the Head of the Establishment is satisfied that exceptional circumstances warrant special treatment, wages not claimed within a year will be forfeited.

(v) Loss of pay card should be reported immediately.

SECTION IV NIGHTSHIFT AND OVERTIME

(27) (i) Payments in addition to normal pay are issuable as follows for hours worked in excess of the normal daily hours, and for hours worked on nightshift or on Sundays, paid holidays and closed days:—

	Period Worked.	Additional Payment an Hour at Day Rate.	
		Dayshift.	Nightshift.
		Hours Pay.	Hours Pay.
(a) Ordinary working days, stocktaking days, and annual leave week.	Normal hours .. Extra hours:— First two .. Subsequent ..	Nil One-third One-half	One-fifth* One-third* One-half
(b) Sundays	All hours between midnight and midnight.	One	One
(c) Paid holidays	Normal hours .. Extra hours ..	Nil One-half	One-fifth* One-half
(d) Other (unpaid) closed days.	Normal and extra hours.	One-half	One-half

* A special rate applies to the Royal Ordnance Factories, Woolwich.

(ii) For the purpose of calculating additional payments under this rule:—

(a) Each day will stand by itself.

(b) An employee must work throughout the normal nightshift hours on not less than 2 consecutive nights to qualify for the additional nightshift payment.

(c) The number of normal weekly hours will be those prescribed for the establishment.

(d) Normal nightshift hours of employees engaged in productive sections will be arranged to fall between Monday midday and Saturday midday, and authorised hours outside this period will, with the exception of Sunday, be treated as extra hours. This clause does not apply to maintenance men.

(iii) The normal number of hours must be worked before the additional payments specified for extra hours accrue, except in the case of:—

- (a) Absence for certified sickness, contagion or injury.
- (b) Absence with leave.
- (c) Enforced idleness.
- (d) Absence on account of working through the previous night in respect of dayshift extra hours or the previous day in respect of nightshift extra hours.

(iv) If short time is being worked, no additional payment as for extra hours will be issuable in respect of hours worked between the full-time starting hour and the full-time stopping hour.

(v) When overtime is worked, the head of the establishment will fix the period which will be allowed for any meal, and such periods will not normally be paid for. When, however, payment is made, additional payments under para. (i) are issuable only in respect of meal times actually worked and for which an equivalent period off is not allowed.

(vi) An employee sent to a distance from his establishment will not in any circumstances qualify for additional payment under para. (i) except for time actually and necessarily worked.

(vii) If an employee is called upon to return to work after having completed, subject to para. (iii) above, the normal hours of work, the additional payment will commence to be paid from the time of restarting at the rate which would have been payable for the particular hours, had he worked continuously. This rule does not apply to employees covered by para. (viii) below.

(viii) An employee on dayshift sent home after midnight on any day, except for misconduct, will receive payment as below for each hour from the time of leaving the establishment until 6 a.m. :—

If sent home between midnight and 2 a.m. 1 hour's pay.
 If sent home after 2 a.m. 1½ hour's pay.

(ix) An employee, who has worked during the day and who is required to go on nightshift the same day, will, if he has worked beyond the usual midday meal, receive payment for the first night's work as for dayshift overtime.

(x) Payments under item (c) of para. (i) are additional to any holiday pay issuable under Rule 49.

(xi) The above rules do not apply to workpeople on double dayshift or the three-shift system, or to other classes employed under special conditions of service.

(xii) Unless the sanction of the Foreman has been obtained, men on nightshift are not allowed to leave work until those who are to take their place for the next shift have arrived.

SECTION V TIMEKEEPING

(28) (i) Employees are required to record at a clock station their times of commencing and leaving work.

(ii) An employee tampering with a Time Recorder Clock, making any erasure or alteration on any Clock Card, defacing a Clock Card, procuring the clocking of his time by another employee, or clocking another employee's time, will be liable to instant dismissal, and, if the action taken was with fraudulent intent, to prosecution for fraud.

If an incorrect stamping has been recorded or an alteration made on an employee's card without his knowledge, he must at once report it or he will be held responsible for the irregularity.

(iii) In the event of failure to clock, sanction for payment will be given if the Foreman is satisfied as to the time actually worked, but the offender will be liable to disciplinary action.

(iv) Employees clocking on after commencement of the call will, provided they start work at once, be checked as follows:—

<i>Time of commencing work.</i>	<i>Check.</i>
Up to 1 minute from commencement of call	Nil.
After 1 minute and up to 15 minutes from commencement of call	¼ hr.
After 15 minutes and up to 30 minutes from commencement of call	½ hr.
and so on.	

Should an employee present himself for work after the Card Racks are locked, he must obtain his clock card from his Foreman.

(v) Employees detailed to work overtime will clock off at the actual time they leave work. Where a break after the normal time for ceasing work is allowed for the partaking of a meal, such break will be deducted from the recorded attendance.

(vi) Bad timekeeping will render the offender liable to suspension or discharge.

(vii) An employee obtaining permission to leave the Factory during working hours must obtain a pass from his Foreman and record his time of departure.

SECTION VI SUBSISTENCE ALLOWANCES AND TRAVELLING EXPENSES

(29) Night Subsistence Allowances.—(i) An employee away from his usual place of duty for a period of absence on temporary duty at an outstation necessitating absence at night from home, i.e. from his usual place of residence, may, except in those cases where other rates are specially authorised, be granted night allowances at the following rates :—

Weekly rate of pay (including bonus).	For the first 7 nights at the outstation.	For the 8th- 28th night at the outstation.	For any further period up to three calendar months at the outstation.
	<i>Rate 1.</i>	<i>Rate 2.</i>	<i>Rate 3.</i>
	<i>s. d.</i>	<i>s. d.</i>	<i>s. d.</i>
90s. and above ..	8 0	6 0	5 0
55s. and under 90s. ..	7 0	5 3	4 8
35s. and under 55s. ..	6 0	4 6	4 0
21s. and under 35s. ..	5 0	3 9	3 4
Under 21s.	4 0	3 0	2 8

(ii) The rates in (i) are the maximum rates admissible. In cases of prolonged detention at an outstation, lower rates may be specially fixed by the Head of the Department sufficient to cover the reasonable extra expenses incurred; special rates will, in any case, be fixed for detention at an outstation beyond three calendar months.

(30) Duty at a Second Outstation.—This rule relates to the issue of night allowance in a case where an employee is transferred from duty at one outstation to duty at a second outstation when it is the intention that he will return after a short period to the first outstation.

(i) If at the time of transfer an employee has been instructed that he will be expected to return to the first outstation, after a stay of not more than six nights at the second outstation, and in consequence has necessarily incurred accommodation expenses there, he may be granted night allowance as follows :—

Rate in Rule 29 at which Payment was being made at 1st Outstation.	Rates Payable During Duty at 2nd Outstation in respect of :—		Rates Payable on return to 1st Outstation.
	1st Outstation.	2nd Outstation.	
(a)	(b)	(c)	(d)
1	Nil	1	1
2	2	1	2
3	3	1	3

(ii) Allowances at the rates in column (b) above will only be admissible to the extent to which the extra expense at the first outstation continues necessarily to be incurred, and they will, in any case, be limited to 6 nights.

(iii) In the case in which an allowance is admissible under column (b) and the employee returns to the first outstation after a stay not exceeding six nights at the second outstation, the allowance admissible at the first outstation after return will continue as if there had been no break in the continuity of stay there. In all other cases return to the first outstation will be regarded as transfer to a new outstation. If the stay at the second outstation exceeds six nights, the rates admissible there will be those under rule 29 and no allowance will be made in respect of the first outstation.

(31) Week-ends, etc.—(i) When duty is to be resumed at an outstation after a week-end or public holiday, instructions may be given by the Head of the Department (a) that the employee is to remain at the outstation, in which case night allowance will be issuable for the week-end or (b) that the employee is to return home for the week-end and travel back to the outstation after the week-end, in which case travelling expenses will be refunded and payment will be made for the travelling time. In cases where no such instructions are issued by the Head of the Department, the amount issuable in respect of the week-end will be the smaller of the two amounts issuable as under alternatives (a) and (b).

(ii) When an employee receives payment as under alternative (b) and resumes duty at the outstation after the week-end or public holiday, subsistence allowance will not be paid for the nights absent from the temporary duty station, but such nights will not be excluded in calculating the periods of 28 nights and 3 months referred to in Rule 29 after which reduced rates of subsistence allowance apply.

(32) Day Subsistence Allowances.—(i) A day allowance will be issuable in respect of the day of return after a period of absence for which a night allowance is issuable, provided that the total period of absence on that day is more than 10 hours counting from the expiration of one or more complete periods of 24 hours from the commencement of the outward journey from home or usual place of duty. The allowance will be at half Rate 1.

(ii) A day allowance will be issuable in respect of a period of absence on duty not necessitating absence at night from home, provided the duty is at a place distant more than 3 miles by the most direct route both from the employee's usual place of duty and from his home, and provided also, that the period of absence is 5 hours or more. If the period of absence is 5 hours and under 9 hours, the allowance will be a quarter of Rate 1, and if the period of absence is 9 hours or more, the allowance will be half of Rate 1.

(iii) (a) When an employee travels from and returns to his usual place of duty, the admissible period of absence will be the period away from his usual place of duty.

(b) When he travels from and returns to his home the admissible period of absence will be the period away from home, subject, however, in any case, to a maximum admissible

period equal to the time that would have been taken had the employee travelled as under (a).

(33) Periods at an Outstation within Daily Travelling Distance.—When an employee is ordered on temporary duty for a period at an outstation which can be reached by daily journeys without detriment to the proper performance of the duty, the Head of the Department will authorise the employee either to remain at night at the outstation or to travel daily. Any additional expense which may be incurred through the employee making arrangements other than those authorised by the Head of the Department will not be allowed.

(34) Night and Day Allowances—Circumstances in which not Payable.—Subsistence allowance will not be payable in respect of periods when an employee is on the sick or injury list or on leave unless payment is specially authorised by the Head of the Department; nor in respect of periods during which an employee is accommodated and rationed at the cost of the public; nor during a sea passage for which the fares include the cost of meals and sleeping accommodation.

(35) Travelling Expenses.—Subject to the following conditions, an employee is entitled to a refund of the travelling expenses necessarily incurred when proceeding on duty :—

- (i) No travelling expenses are admissible between his home and his usual place of duty.
- (ii) The refund of travelling expenses will not exceed the cost of the cheapest means by which the duty can be efficiently performed.
- (iii) Gratuities to railway porters, etc., and booking fees, will not be refunded.
- (iv) (a) When an employee travels from and returns to his usual place of duty, the travelling expenses refunded will be for the cost to and from his usual place of duty.
(b) When an employee travels to and from his home, the travelling expenses refunded will be the cost to and from his home, subject, however, in any case, to a maximum amount equal to the cost of the journeys that would have been taken if the employee had travelled as under (a).

(36) **Travelling Time.**—When an employee travels on duty to (or from) an outstation the time necessarily taken in travelling from (or to) his usual place of duty, or his home, will be paid for at common time rate, subject to a maximum payment equal to the payment admissible from (or to) his usual place of duty.

SECTION VII

INJURIES AND SICKNESS

(37) **Reporting of injuries.**—An employee who is injured, however trivially, while at work, or who claims to have contracted an industrial disease due to the nature of his employment, must report to his Foreman immediately, and, if so instructed must proceed at once to the Surgery. The instructions of the Factory Medical Officer must be observed. Non-compliance with this rule may entail loss of Injury Pay or Compensation.

(38) **Injuries within the scope of the Workmen's Compensation Acts.**—An employee who is incapacitated from performing his work as a result of an injury or industrial disease falling within the scope of the Workmen's Compensation Acts, will be dealt with in accordance with those Acts, unless he had previously accepted the Government Scheme of Compensation, current at the date of injury, when he will be dealt with under such Scheme.

(39) **Disabilities arising out of employment, but not within the scope of Workmen's Compensation Acts.**—If an employee incurs a disability clearly due to the nature of his work, though not by accident arising out of, and in the course of his employment, or by an industrial disease scheduled under the Workmen's Compensation Acts, as an act of grace payments may be made to him for a limited period equivalent to the weekly Compensation which would be issuable under the Act or Scheme, as the case may be, in respect of a disability covered by them, less the appropriate deductions in respect of National Health Insurance Benefit (which is issuable in respect of such absence). In order to

enable such Benefit to be claimed by the individual concerned, a Medical Certificate certifying the disability must be obtained from the Factory Medical Officer.

(40) **Negligence.**—Anyone who through negligence or carelessness subjects himself or his fellow workmen to the liability of injury is liable to disciplinary action.

(41) **Hospital Deductions.**—An employee who is accorded Hospital treatment will be charged for subsistence, subject to the proviso that if the treatment is accorded under the Government Compensation Scheme, the charge will be so regulated that in no week does it reduce the Hurt Pay or compensation issuable below the amount prescribed in the Scheme.

(42) **Notification of Sickness.**—If sick, an employee must report immediately to his Foreman. If not a Factory panel patient he must forward his own doctor's certificate to the Factory Medical Officer (stating his department, number, age and address), failing which he may be treated as an absentee; and before resuming work he must attend at the Factory Surgery bringing with him a certificate of fitness.

(43) **Sick Pay.**—No Departmental sick pay is issuable except to certain employees who entered as adults prior to 15th July, 1912 and have reserved privileges as shown in appendix B of the Eighth Edition of the R.O.F. Rules, and to certain special grades for which separate instructions have been issued.

(44) **Sickness due to Vaccination.**—Half day rate, subject to the regulated deduction for N.H.I. benefit, will be issuable during sickness due to vaccination, for a period not exceeding 3 weeks, in any of the following circumstances:—

- (i) Where a general notice urging vaccination or re-vaccination has been issued.
- (ii) In any case in which, on the recommendation of the Factory Medical Officer, vaccination has, in the interest of the Department, been carried out.
- (iii) In the case of new entrants who are required as a condition of their employment to be vaccinated or re-vaccinated and who have actually started work.

(45) Medical Attendance.—Insured employees at Woolwich Arsenal or Woolwich Dockyard resident within a radius of one mile from a point midway between the Main and Plumstead Gates may choose the Factory Medical Officer as their panel doctor under the National Health Insurance Acts.

(46) Discharge of Employees on account of Infirmity of Mind or Body.—(i) Employees who are reported by the Factory Medical Officer to be permanently medically unfit will be discharged from the date of such report.

(ii) Subject to the above paragraph, cases of prolonged sickness will be reviewed at the expiration of three months, or in the case of employees eligible for Departmental Sick pay, when the normal allowance period is exhausted; and retention on the books will depend on the circumstances of the case. Only in exceptional cases will retention on the books after the expiration of six months' sick leave in any period of twelve months be approved.

(iii) Men frequently absent through sickness are liable to be discharged as physically unfit for duty.

SECTION VIII

INFECTIOUS

(47) Notification of Infectious Diseases.—Employees must not come to work after contact with infectious diseases, but must arrange for immediate notification to the Factory Medical Officer and await his instructions.

(48) Pay.—Pay will be allowed in the case of enforced absence while arrangements are being made to prevent infection, provided the Factory Medical Officer is satisfied that the absence is of the shortest duration permissible in the circumstances.

Such pay will normally be limited to one week at day rate, but an extension at half rate for any period that may be necessary beyond the second week (no pay being issuable for the second week) may be approved in special cases in which a certificate is produced from the local Medical Officer of Health to the effect that isolation arrangements are impeded by lack of hospital accommodation, or by danger to life incidental upon the removal of the patient.

SECTION IX

HOLIDAYS AND CLOSED PERIODS

(49) Holidays.—Subject to the exigencies of the service the following will be observed as holidays in the Royal Ordnance Factories generally; and, at the Royal Arsenal and Dockyard, Woolwich, only, the second Saturday in July (Beanfeast Day) in addition.

Good Friday.

Friday afternoon and Saturday prior to Whit Sunday (King's Birthday).

August Bank Holiday (one other day may be substituted to suit local conditions).

Christmas Day.

Boxing Day (except in Scotland).

New Year's Day (in Scotland only).

In the case of employees on duty away from the Factories other days may be substituted to suit local conditions.

For these periods, pay at day rate is issuable subject to the following conditions:—

(i) Pay is issuable for a holiday occurring during or immediately before or after a period of unpaid leave, provided the employee has been at work within 12 days of the holiday; and for a holiday occurring on the day following date of discharge, provided discharge was not on account of misconduct.

(ii) Pay is not issuable to employees on unpaid sick leave who have been retained on the books after the expiration of six months sick leave in any period of twelve months immediately prior to the holiday, or to employees who are under suspension for any causes other than those under Rule 18.

(iii) Subject to para. (ii) pay is issuable to employees otherwise qualified who are on the sick, contagion, or injury lists, and such pay includes any sick, contagion or injury pay issuable in respect of the holiday.

(iv) Pay is liable to forfeiture if the employee has absented himself without leave during the last working period immediately prior to or during any period of the working day next following the holiday, or during any period of extra attendance required of him at the end of the day preceding or on the day following the holiday.

(50) Closed Periods.—(i) The Royal Ordnance Factories will normally be closed on the following days:—

The Saturday before Easter.

Easter Monday.

Whit Monday (except in Scotland).

2nd January (in Scotland only).

Annual Stocktaking Days, and such other periods as may be notified from time to time.

(ii) For such days no pay will be issued; but in a week containing a closed period, other than a closure in conformity with local custom or to suit the convenience of the majority of the employees, an adult full time employee who during the week has "earnings" as defined below, will receive an allowance determined as follows:—

(a) If a day worker on the minimum rate, so much pay, if any, for the closed period as may be necessary to bring his earnings for the week up to the minimum rate for a full ordinary week; but such pay will not in any case exceed the value of the period of closure calculated at the minimum rate.

(b) If other than a day worker on the minimum rate, so much pay, if any, for the closed period as may be necessary to bring his earnings for the week up to the amount he would have received if he had been a day worker on the minimum rate.

(iii) Employees who are on the sick, injury or contagion lists during the closed period will not be eligible for any allowance under this Rule but will receive such sick, injury or contagion pay as they would receive if the Factories had been open.

(iv) Any allowance otherwise issuable under this Rule is liable to be forfeited if holiday pay has been withheld for a paid holiday immediately before or after the closed period, or if the employee had failed in respect of the closed period to comply with the general conditions governing the issue of holiday pay (*see* Rule 49) or if, in the opinion of the Head of the Department, he has not fully availed himself of his opportunities for earning.

(v) No allowance under this Rule is issuable in respect of periods of suspension (whether disciplinary or non-disciplinary).

(vi) "Earnings" for the purpose of this Rule include all wage payments, payments in respect of leave, allowances and bonuses, except absence allowance and payment for fire drill. They do not include sick, injury or contagion pay.

(vii) The minimum rate is the current minimum rate for adult unskilled labour (male or female, as the case may be), duly authorised for the establishment in question.

SECTION X

LEAVE, ETC.

(51) Annual Leave.—(i) The leave year is from 1st February to the 31st January; and, subject to the exigencies of the service, the Factories will close each summer for the annual leave week, which, at Woolwich, will normally be the week preceding the August Bank Holiday.

(ii) Payment will be made as follows to employees placed on leave for the annual leave week:—

(a) If the employee has completed 12 months' continuous service—one week's pay at day rate.

(b) If he is an adult not qualified under (a) above—an allowance under Rule 50 as for a closed period.

(c) If he qualifies under (a) above by the following 31st January, at the date of qualification, one week's pay at the day rate held at the annual leave week less any payment or allowance made under (b) above.

(d) If he is otherwise eligible for annual leave he will be required to take the week within his annual leave scale, and will be paid accordingly.

(iii) An employee required to work during the annual leave week, or debarred from being placed on leave as being on the sick, injury or contagion list, or on special Territorial leave with pay during the week, may be allowed at another time :—

(a) If he has 12 months' continuous service—one week's leave with pay,

(b) If he has given 12 months' satisfactory service in the last 3 years of which not less than 6 months' service is continuous since the date of last entry—leave with pay at the rate of 1/12th week for every complete month of service during the leave year of entry,

provided that such leave is completed before the following 31st January.

(iv) An employee debarred from Holiday Pay under Rule 49 (ii) will not be eligible for leave or payment under (ii) or (iii) above.

(v) An employee due to be discharged under Rule 24 for age before or during the annual leave week, may be allowed as leave with pay the portion of one week proportionate to his completed months of service since 1st February, but his service will not be extended beyond the due date of discharge to allow such leave to be taken.

(vi) Leave cannot be carried forward from one leave year to the next; nor is payment issuable in respect of leave not taken.

(52) Absence without Leave.—(i) Leave not approved counts as lost time.

(ii) Any employee who absents himself without leave for two consecutive days will be held to have left his employment, and will be struck off the books, unless the Head of the Department shall decide otherwise.

(53) Lads attending Classes.—(i) Leave of absence with pay on the following days is granted if work permits to lads under 21 years of age who attend in their own time classes in not less than two approved subjects and who produce satisfactory certificates for the preceding six months.

(a) Easter Monday.

(b) Whit Monday.

(c) The afternoons of two appointed days of local Sports Meetings.

(ii) The term "approved subjects" includes languages in preparation for an examination which can, in the case of the lad concerned, be regarded as vocational in regard to his employment in the Royal Ordnance Factories.

(iii) All lads, including Apprentices, who wish to be considered for this privilege, must report to their Foreman directly they commence attending evening classes, so that their progress may be recorded. Failure to report at the time indicated may entail loss of the privilege.

(54) Service as Jurors and Witnesses.—(i) Employees serving on Juries will receive pay at day rate, minus Court Allowance. If summoned as witnesses they should recover their expenses in the usual way but in no case will they be paid by the Royal Ordnance Factories for the time they are absent from their work unless they have been ordered to attend the Court on behalf of the Factories, and their Court Allowance is not equal to their normal day rate for the period of necessary absence. In the latter event the difference will be made up.

In all cases a certificate in respect of Court attendances and allowances on a form obtainable on application to the employee's Foreman must be produced.

(ii) Employees of the War Department are not permitted to accept invitations to appear as expert witnesses in private lawsuits for the purpose of giving evidence on matters of which they have acquired knowledge in the course of, and in connection with, their official duties. An employee who receives an invitation of this nature should reply that official regulations do not allow him to give such evidence.

If an employee, after replying in these terms, is nevertheless subpoenaed to appear as an expert witness, the matter should be reported, through the usual channels, so that instructions may be given as to what further action should be taken.

(55) Service for Increment.—Complete days lost on account of absence without leave, of unpaid leave other than that allowed for purposes of attending annual training in Territorial, Auxiliary and Reserve Forces, or of sick leave in excess of three months in any period of twelve months unless pay is issuable for such excess, will not count for incremental purposes.

R. TOWNSEND,

Director of Ordnance Factories.

28th October, 1937.

APPENDIX A

GRATUITIES

1. General Conditions.—Under the provisions of the Superannuation Acts gratuities on discharge are issuable as follows at the discretion of the Treasury to employees not on the pensionable establishment, subject to the employee's diligence and fidelity warranting the award and on the conditions set forth below.

Cause of Discharge.	Minimum qualifying service (see 4 to 9 below).	Maximum amount of gratuity.
(i) Reduction of Establishment	7 years	} One week's pay for each completed year of service (see 3 to 9 below).
(ii) Infirmary of mind or body (certified to be permanent).	15 ..	
(iii) Age (60 years or over)	15 ..	
(iv) Death whilst borne on the books of the Department. (Issuable only if dependents are left.)	15 ..	

2. Method of Computation.—(i) Gratuities are based on substantive day rates or on the average of such rates during the last 3 years of service.

(ii) No gratuity will exceed one year's pay.

(iii) The amount may be subject to reduction for misconduct.

3. Stipulations as to Service.—All service prior to attaining the age of 16 years, and certain categories of service above that age, are excluded.

4. Deductions from Service.—Complete days lost during the last 10 years of service for the reasons specified below will not normally count as service:—

(i) Absence without leave.

(ii) Absence with leave but without pay in any calendar year in excess of the number of days by which the employee's allowance of paid leave falls short of 18 days. Leave for attendance at certain public committees will, however, under certain conditions, count.

- (iii) Suspension for breach of regulations.
- (iv) Suspension under Rule 18.
- (v) Sick leave in excess of three months in any period of 12 months (unless pay is issuable for such excess), or of 12 months in any period of 4 years.
- (vi) Unpaid sick leave occurring at the end of an employee's service.

5. Reckonability of Periods of Service.—In cases in which the service is not continuous, no period of service will normally count :—

- (i) If rendered prior to a date on which service was terminated for a cause other than one of those specified in (i) to (iii) of the Table in para. 1.
- (ii) If rendered prior to a break of 3 complete years.
- (iii) If rendered prior to a date at which the sum of the breaks amounts to 7 years.
- (iv) Unless either it is a continuous period of not less than 156 working days or it amounts with other service rendered in the calendar year in question to a total of not less than 156 working days. In the case of service rendered in the first and last calendar years of service, this condition will be held to be satisfied if the service rendered amounts to not less than half the period between the date of entry and December 31st, or between January 1st and the date of discharge respectively.
- (v) If a gratuity has previously been awarded in respect thereof (unless refunded), (*see* 7 below).

6. Service in other Departments.—Service in another Government Department qualifying for gratuity under the Superannuation Acts will count subject to the above conditions, provided that such service was terminated by discharge for one of the causes specified in (i) to (iii) of the Table in para. 1. or by direct transfer.

Special conditions apply where service has been rendered under the Government of India, or of a Dominion or Colony.

7. Refund on Re-Entry.—An employee may on re-engagement refund any gratuity he may have received in respect of previous service, with a view to such service being counted for gratuity on final discharge, provided that :—

- (i) The application to refund is made within one year of re-employment.
- (ii) The refund is made in one sum directly the application is approved.
- (iii) Paragraph (5) does not preclude the reckoning of the previous service.

Up to the date on which refund is actually made, the applicant will remain on the footing of a new entrant, and in the event of final discharge for a cause other than one of those specified in paragraph 1, or without the necessary qualifying service therein specified, no gratuity whatever will be issuable.

APPENDIX B

RULES RELATING TO PARTICIPATION OF GOVERNMENT EMPLOYEES IN GOVERNMENT CONTRACTS, SALES, ETC.

The following general rules relative to participation in Government contracts by, and the purchase of Government stores from, or their sale to, Government employees must be observed by all concerned :—

1. Unless the employee concerned shall have first disclosed fully to the Head of his Department the measure of his interest in the contract, and permission of such Head of Department shall have been given for the contract, purchase or sale to proceed, notwithstanding the interest held by such employee.

- (i) No Government contract shall be let to an employee of the contracting department or to any partnership of which he is a member (apart from a corporation in which he is a shareholder).
- (ii) No Government contract shall be let to any company of which an employee in the contracting department is a director (except as a nominee of His Majesty's Government).

- (iii) No employee shall be permitted to accept a directorship, except as a nominee of His Majesty's Government, in any company holding a contract with his Department.
2. No purchase shall be made from, and no sale made to, any employee without the express sanction of the Treasury except as follows :—
- (i) Transactions occurring in the ordinary course of public business, e.g., the purchase of Stationery Office publications, National Savings Certificates, postage stamps, money orders, etc.
 - (ii) Sales of provisions, clothing, etc., under regulations approved from time to time.
 - (iii) Sale of old stores, etc., at fixed prices (available to the public).
3. In no circumstances should any employee negotiate or arbitrate in any matter affecting a contract, purchase or sale, where, in his private capacity, he is interested either as a principal or as a shareholder in a company being one of the principals to the matter under consideration.
4. All employees are reminded that it is their duty, if they have occasion to come into contact with any matter concerning a business organisation, in which they have an interest, to disclose that interest to the Head of their Department for such action to be taken as may be considered necessary.

APPENDIX C

ENLISTMENT INTO TERRITORIAL, AUXILIARY AND RESERVE FORCES

The conditions set out hereinunder govern enlistment into the Forces referred to above :—

1. The written consent of the Head of the Department must first be obtained and produced by the employee when enlisting.
2. Enlistment is limited to 5 per cent. of the total employees of the Department. Consent will be extended only to those whose services can be spared immediately in an emergency, and in the case of an individual taking up a commission in

the Reserve of Air Force Officers or enlisting into the Royal Air Force Reserve (including Special Reserve) during the requisite period of initial training as a pilot.

3. The Forces which employees may be permitted to join or, if eligible, to re-engage in, are as follows :—

The Territorial Army (except National Defence Companies).
 The Royal Naval Volunteer Reserve.
 The Auxiliary Air Force.
 The Supplementary Reserve (Categories "B" and "C").
 The Army Reserve (Section D).
 The Royal Naval Reserve.
 The Royal Fleet Reserve.
 The Reserve of Air Force Officers.
 The Royal Air Force Reserve.
 The Royal Air Force Volunteer Reserve.

An Employee is not allowed to enlist into Voluntary Aid Detachments, the National Defence Companies of the Territorial Army, or the War Department Constabulary Reserve, nor is he allowed to take a Commission in the Supplementary Reserve of Cavalry, Artillery, Tanks, Foot Guards and Infantry unless exempt from preliminary training. Permission may, on certain conditions, be given to enrol into the Metropolitan Constabulary Reserve.

4. (i) A regular employee who is a member of the Territorial Army and who attends the annual training in camp for the full period of a fortnight may be allowed special leave with pay on the following scale :—
- (a) An employee with an annual leave allowance of 18 days or less, a special leave allowance of 12 days.
 - (b) An employee with an annual leave allowance of more than 18 days but less than 24 days, a special leave allowance sufficient to bring the total allowance (special and annual leave combined) up to 30 days.

- (c) An employee with an annual leave allowance of 24 days or over, a special leave allowance of 6 days.
- (ii) A regular employee who is a member of the Royal Naval Volunteer Reserve will be allowed special leave with pay as in (i) above in any year in which 14 days' naval training is undertaken and twice that amount in any year in which 28 days' naval training is undertaken, provided always that the total special leave with pay for naval training in any period of four years does not exceed three times the amount of the scale allowance.
- (iii) A regular employee who joins the Auxiliary Air Force as an airman and who attends annual training with a unit for so long as a fortnight will be allowed special leave with pay as in (i) above. A similar allowance may be granted to an employee who is an officer of the Auxiliary Air Force, provided that the period of training in any one year—either annual training with a unit or periodical flying or both combined—is not less than a fortnight.
- (iv) A regular employee who is a member of the Supplementary Reserve, the Army Reserve (Section D), the Royal Naval Reserve, the Royal Fleet Reserve, the Royal Air Force Reserve, including the Reserve of Air Force Officers, or the Royal Air Force Volunteer Reserve, will be allowed special leave with pay on the scale laid down in (i) above when attendance is required for the purposes of annual training; reservists of these forces when liability for annual training is limited to 12 days (which may include Sundays) will qualify for special leave with pay, provided that they complete that period of training.
- (v) The grant of any special leave with pay, under (i) to (iv) above, is subject to the condition that the period of training is not less than that specified.
- (vi) Any special leave granted for the purposes of preliminary training in the Reserve Forces mentioned in (iv) above will be reckoned either as annual leave or as special leave without pay. Any such special leave without pay will be allowed to count for increment.

APPENDIX D

RESTRICTIONS ON OUTSIDE EMPLOYMENT

- (1) No employee will be allowed to accept any part in the management of any society, or trading, commercial, industrial or financial firm or company which would require the attendance of such employee at any time during the normal working hours of the establishment in which he is employed.
- (2) No employee will at any time engage in any activity which would in any way tend to impair his influence as a public servant nor will he engage in any occupation or undertaking which might in any way conflict with the interests of the War Department, or be inconsistent with his position as a public servant.
- (3) Any employee who may have any doubt as to the propriety of undertaking any particular work will report the circumstances for the consideration of the Head of his Establishment. In particular, reference to the Head of the Establishment should be made before any professional consultative work is undertaken.
- (4) The undertaking of a banking business by employees is regarded as incompatible with employment under the War Department.
- (5) Special leave, with or without pay, will not be granted to enable any employee to undertake obligations involving possible interference with his duties under the War Department.

RESTRICTIONS ON OUTSIDE EMPLOYMENT

The following restrictions shall apply to all employees of the University of California, who are employed in a position which requires the full-time attention of the employee.

1. No employee shall engage in any other occupation, profession, or business which interferes with the performance of his or her duties as an employee of the University.

2. No employee shall engage in any other occupation, profession, or business which is in competition with the University.

3. No employee shall engage in any other occupation, profession, or business which involves the use of confidential information obtained in the course of his or her employment with the University.

4. No employee shall engage in any other occupation, profession, or business which involves the use of the University's name or reputation.

5. No employee shall engage in any other occupation, profession, or business which involves the use of the University's facilities or equipment.

6. No employee shall engage in any other occupation, profession, or business which involves the use of the University's funds.

7. No employee shall engage in any other occupation, profession, or business which involves the use of the University's property.

8. No employee shall engage in any other occupation, profession, or business which involves the use of the University's name or reputation.

9. No employee shall engage in any other occupation, profession, or business which involves the use of the University's facilities or equipment.

10. No employee shall engage in any other occupation, profession, or business which involves the use of the University's funds.

11. No employee shall engage in any other occupation, profession, or business which involves the use of the University's property.

12. No employee shall engage in any other occupation, profession, or business which involves the use of the University's name or reputation.

13. No employee shall engage in any other occupation, profession, or business which involves the use of the University's facilities or equipment.

14. No employee shall engage in any other occupation, profession, or business which involves the use of the University's funds.

15. No employee shall engage in any other occupation, profession, or business which involves the use of the University's property.

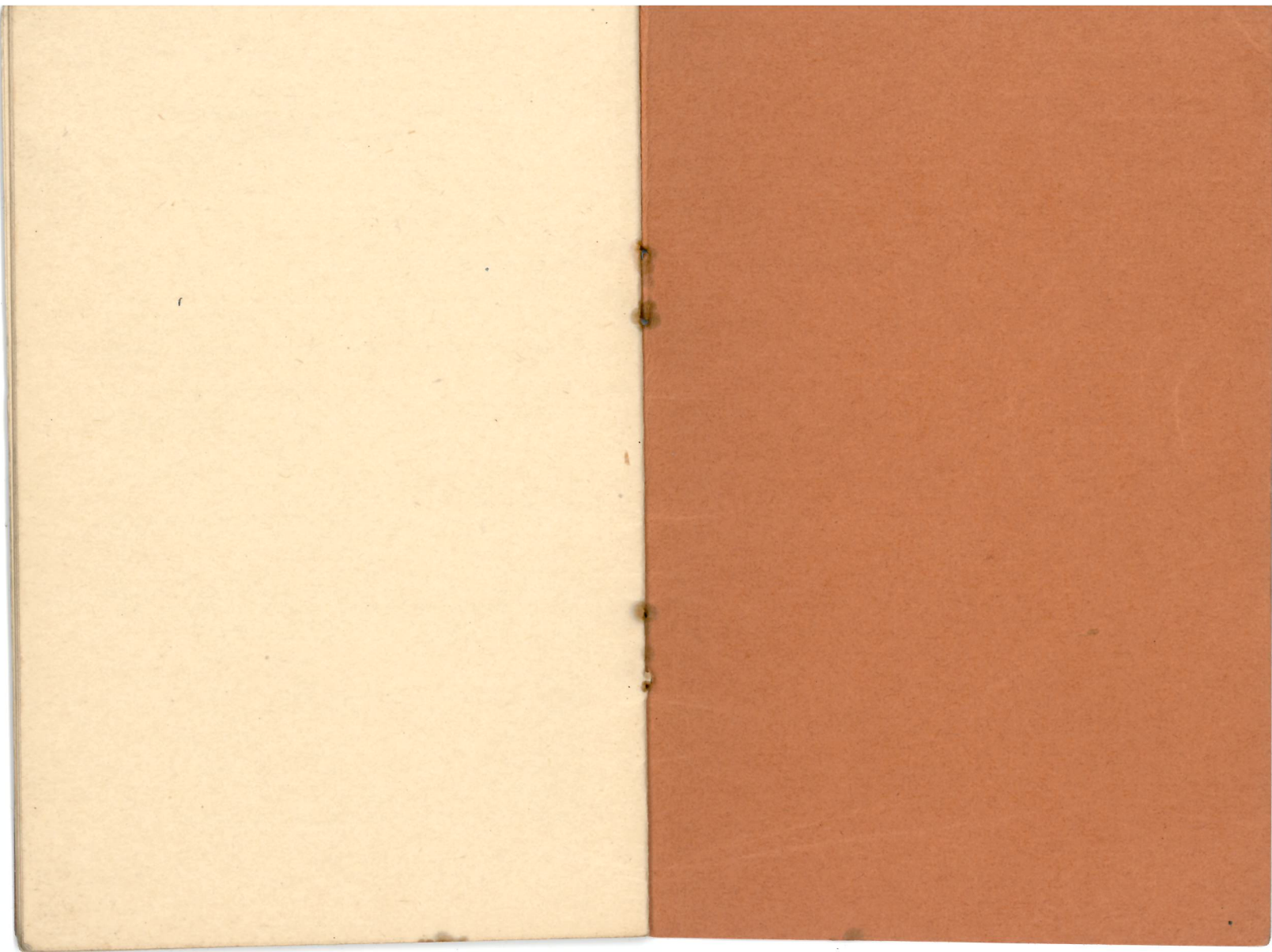
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No. 157



MINISTRY OF SUPPLY

RULES
AND
REGULATIONS
OF THE
CHEMICAL RESEARCH
AND
DEVELOPMENT DEPARTMENT
WALTHAM ABBEY, ESSEX

1946

CONTENTS

	PAGE
INTRODUCTION	3
ADMINISTRATION OF THE RULES AND REGULATIONS ...	4
DEFINITIONS	5
GENERAL RULES	6
DANGER BUILDING RULES	10
TRAFFIC RULES	12
SAFETY REGULATION	14
AUTHORISATION OF BUILDINGS AND PLANT FOR EXPLOSIVES USE	14
SPECIAL RULES, OPERATING INSTRUCTIONS, LIMITS ...	14
CLEARANCE PROCEDURE IN DANGER BUILDINGS AND PROOF STANDS	15
EMERGENCY OR MINOR REPAIRS (EXPLOSIVES PLANT) ...	17
CLEARANCE PROCEDURE FOR EXPLOSIVES PLANT FOR REMOVAL	18
BURNING, WELDING AND FLAMING OF PLANT AND EQUIP- MENT	19
REPAIR OF PLANT WHERE DANGEROUS GASES OR FUMES MAY BE PRESENT	20
REPAIR OR MAINTENANCE TO NON-EXPLOSIVES PLANT ETC.	21
SALVAGE	22
STORAGE OF EXPLOSIVES, AMMUNITION ETC.	23
TRANSPORT OF EXPLOSIVES	24
BULK STORAGE AND USE OF SOLVENTS	25
DISPOSAL OF WASTE EXPLOSIVES, SOLVENTS ETC....	26
REGISTERS REQUIRED UNDER THE FACTORIES ACT...	26
ISSUE OF LIFTING TACKLE AND LADDERS	27
FENCING AND GUARDING OF MACHINERY, PITS AND VESSELS	28
USE OF PORTABLE ELECTRICAL ENGINEERING EQUIPMENT	28

	PAGE
TOOLS, CARE OF	29
CYLINDERS AND DRUMS OF LIQUEFIED OR COMPRESSED GASES	29
SAFETY APPLIANCES	30
SAFETY PRECAUTIONS FOR LABORATORIES... ..	31
PROCEDURE IN CASE OF FIRE DURING WORKING HOURS ...	33
ACTION IN CASE OF SERIOUS ACCIDENTS	34
DANGER BUILDING CLEARANCE CERTIFICATE (APPENDIX A)	35
RULE READING CERTIFICATE (APPENDIX B)	36
REPAIR OR DISPOSAL CERTIFICATE (APPENDIX C)	36
REPAIR OF PLANT CLEARANCE CERTIFICATE (APPENDIX D)	37
CHEMICAL WORKS CLEARANCE CERTIFICATE (APPENDIX E)	38
APPLICATION FOR PERMANENT OR TEMPORARY FIRE (APPENDIX F)	39
APPLICATION FOR ALTERATION OF EXPLOSIVES/MAN LIMITS ETC. (APPENDIX G)	40
IDENTIFICATION COLOUR CODE FOR GAS CYLINDER (APPENDIX H)	41
COLOUR CODE FOR PIPING (APPENDIX I)'... ..	42
INDEX	43

Introduction

These rules have been drawn up for observance by all personnel employed at the Chemical Research and Development Department Station at Waltham Abbey in order to ensure orderly conduct and the prevention of accidents.

The rules are subject to amendment from time to time, and are to be read in conjunction with the Civilian Staff Regulations, 1939, and subsequent amendments and Departmental Instructions. Work at this station conforms to the requirements of The Explosives Act, 1875 and 1923, The Factories Act, 1937, and all statutory rules and orders issued in connection with these Acts, except buildings specially designated by the Chief Superintendent as laboratories.

Administration of the Rules and Regulations

1. All persons employed in the Station will be provided with a copy of these rules. This copy is to be kept in good order, produced when required, and surrendered on termination of service.

2. Portions of the rules and amendments selected by the Safety Officer are to be read monthly to all persons by the foreman responsible for their supervision. A certificate (Appendix B), will be passed by the foreman to the Safety Officer after each reading.

3. Special Rules and Operating Instructions, as posted in the various Danger Buildings, Proof Stands and Burning Grounds, are to be read weekly to the operators concerned by the person nominated by the scientist in charge of the group. A record of such readings will be kept by the scientist in charge.

4. Any infringement of the rules will render the offender liable to disciplinary action, which may involve suspension or discharge.

Definitions

5. The name "Danger Building" means any magazine, building or part thereof in which finished explosives, explosives or their ingredients in any stage of explosives manufacture, or explosives packages, are handled. The name also includes trucks and other means for conveyance used in connection with such manufacture or handling.

6. "Danger Building" as applied to buildings, platforms, trucks, clothing etc., means that they are so constructed, arranged and maintained as to ensure absence of grit, dust or other extraneous matter and are only to be used for, or in connection with, explosives.

7. The name "Laboratory" applies to all buildings so designated by the Chief Superintendent in writing. These buildings are not subject to The Factories Act, 1937, or The Explosives Act, 1875.

8. The name "Area" applies to any area specially allocated for certain operations and is subject to The Factories Act, 1937, and/or The Explosives Act, 1875.

9. The name "Proof Stand" applies to all buildings so designated by the Chief Superintendent in writing, and are subject to The Factories Act, 1937, and/or The Explosives Act, 1875.

General Rules

10. Entering or leaving station.—No person is to enter or leave the station except by the authorised gates, unless so authorised. No person under the rank of A.E.O. is to leave at any but his authorised time without a pass signed by the appropriate higher authority.

11. Prohibited articles.—All persons are forbidden to bring or to introduce into the station, except into areas specially authorised by the Chief Superintendent, any of the following articles:—

Tobacco.

Tobacco pipes and smoking implements of all kinds.

Snuff

Matches and any means of striking or procuring a light or fire

Chemicals and any dangerous articles such as an explosive of any sort.

Wines, beer or spirits.

Medicine and drugs (except on production of medical certificate and by permission of the Safety Officer).

Pastilles, lozenges, chewing gum and sweets of all kinds.

Scent.

No person in Danger Building Clothing is to be in possession of any personal articles except money (in the bag provided), a handkerchief, and plain rings without stones which are too tight to be removed.

It must be clearly understood that other personal articles are to be deposited in the shifting rooms at the owner's risk.

Any person finding himself when inside the station to be in possession of forbidden articles is at once to deliver them to the nearest official who will advise the police to collect.

12. Searching.—On entering or leaving the station all persons are to submit themselves or any bag, basket or parcel to be searched if so required by the police.

All persons, including service workmen employed in danger buildings, are to be searched before commencing work by the senior worker present.

13. Smoking.—No smoking is allowed in the Station except in places specially authorised by the Chief Superintendent.

14. Food.—All persons bringing in food must deposit it at the canteen before proceeding to work. Food is not to be taken into any other building except where authorised.

15. Fires.—

(a) *General.* No fires or naked lights are to be used in the station except in places or by persons duly authorised. Internal combustion or C.I., engines, electric drills, or steam engines, portable electric lamps, flint or electric lighters are for the purpose of the rules, fires.

(b) *Permanent fires.* Standing authority will be granted in respect of approved permanent fires or lights on application to the Safety Officer.

(c) *Temporary fires.* Application for temporary fires or lights must be made through the scientist in charge of the group in duplicate on the approved form (Appendix F) to the Safety Officer, who will specify any precaution necessary. One copy will be passed to the Fire Brigade Officer and the other retained by the worker responsible for the fire and afterwards returned, duly signed, to the Safety Officer.

Plant requiring burning or flaming is, in addition, subject to special precautions and dealt with in the Safety Regulations (page 14).

16. Obedience to orders.—All workers are to obey the orders of the foremen, senior workers, etc.

Should any grievance be felt against any order, representation may subsequently be made to higher authority.

17. Conduct.—All persons are to check in themselves or others, any tendency towards skylarking or carelessness. There is to be no loitering or irresponsible conduct.

Undue noise is to be avoided.

18. Keys.—Keys of all buildings except laboratories will be under the custody of the foreman.

Keys for laboratories will be held by the scientist in charge or his deputy, and duplicates by the police for issue to authorised persons.

Keys are to be issued by the police only to persons authorised to receive them.

19. Exits of buildings.—Doors of buildings in use are to be kept unlocked and unbolted, and doors and passage-ways are to be kept free from obstruction.

20. Security of buildings.—When not in use buildings are to be kept locked. Leading workers are to see that windows and shutters are fastened and bolted, all lights extinguished, isolator switches switched off, and all outer doors locked on leaving their buildings.

21. Anything unusual to be reported.—All persons are immediately to report to higher authority anything unusual or apparently dangerous which they may observe.

22. Workmen to keep to their own work.—No person is to interfere with anything in the Station, such as lines and points, buildings and their fittings, plant, machinery, tools etc., except in the fulfilment of his duty.

23. Electrical and gas fittings.—No unauthorised person is to interfere with the electrical or gas installations or fittings.

Permanent electrical equipment is to be inspected by the Electrical Section at intervals as laid down by the Chief Engineer.

24. Factory Cleanliness.—Plant, buildings and the Station generally are to be maintained in a clean condition and free from accumulations of rubbish and waste. Service departments are responsible for removing their waste upon completion of their work.

25. Sponge cloths and cotton waste.—Sponge cloths and cotton waste which have been used with oils and turpentine are not to be taken into any building in the Station except for immediate use. After such use they are to be removed immediately to the metal containers provided solely for that purpose outside the building.

26. Economy in the use of material.—Strict economy is to be observed in the use of materials and service supplies. Arrangements made for salvaging are to be observed.

27. Fire fighting equipment.—The leading worker in each building is to arrange:—

- (a) To keep hoses, fire extinguishers, buckets etc., ready for use and in the position assigned to them.
- (b) To keep drowning tanks filled as directed.
- (c) To ensure that fire-fighting equipment is not used for any but fire-fighting purposes.

28. First Aid equipment.—Foremen will be responsible for ensuring that First Aid boxes in their area are kept in good order and supplies replenished.

First Aid boxes in laboratories will be in charge of the appointed First Aid assistant for the laboratory.

29. Driving belts and machinery in motion.—Driving belts are not to be put on or taken off pulleys, nor is overhead shafting to be lubricated or adjusted, by any but authorised persons.

All belts on machines when in motion are to be covered by a guard.

Machines are not to be cleaned when in motion.

Belts are not to be left resting on revolving shafting.

Ladders are not to be placed or left in positions giving access to unguarded shafting in, or liable to be set in, motion.

Fencing and machinery guards provided for safety purposes must be fixed except when a machine is being repaired or adjusted and is not in motion.

30. Ladders and ropes.—Ladders, when in use, are to be held by another person or secured at the top. Boys are not to hold ladders.

Ladders and ropes are not to be used in pools or sumps unless the nature and location of the work demands it; they are to be kept away from acids and other liquids likely to attack and rot the material.

Improvised or defective ladders are not to be used.

Ladders employed for access to tanks are to project approximately 3 feet above man-holes or the sides of the tanks.

31. Scaffolding.—Where it is necessary to erect scaffolding for repairs or maintenance work, it is to be constructed with due regard for normally accepted safety precautions.

No person is to use scaffolding at heights above 10 ft. from the ground or floor unless adequate hand-rails and toe-boards are provided.

32. Vessels containing dangerous substances.—No plank, gangway or covering other than that designed and fitted for the purpose, is to be placed across any uncovered vessel containing acid, hot water or any other dangerous substance.

No person is to walk on the covers of any covered vessel containing acid, hot water or any other dangerous substance. Only the gangways and planks designed for the purpose are to be used for crossing such vessels.

33. Disconnecting pipe lines.—No pipe line or valve liable to contain a dangerous substance is to be disconnected or repaired *in situ* until a clearance certificate has been obtained.

34. Spillage of acids or dangerous liquids.—In the event of the accidental spillage or leakage of acid or dangerous liquid, immediate notification is to be made to the foreman or higher authority who will take the necessary steps to minimise danger.

35. Cleaning, repair or decontamination work.—Where cleaning or repair work involves unsafe conditions a cautionary notice is to be displayed.

Any person removing floor boards, gratings, hand-rails or other protective appliances for any purpose, is to replace them immediately the work is completed, or temporarily suspended; otherwise an equally safe alternative is to be provided.

36. Toxic Gases.—No person is to enter any tank or place where there is reason to suspect danger from toxic gases until a clearance certificate has been issued.

Any person who feels the effect of dangerous fumes is immediately to report to the leading worker present, who will arrange for his removal to the surgery in the manner prescribed in Rule 134.

37. Use of goggles or eyeshields.—Persons employed on grinding, welding or on operations giving rise to flying fragments or abrasive dust or on processes involving risk of personal injury from splashes of dangerous liquids are to wear the goggles or eyeshields provided.

Danger Building Rules

38. Opening danger buildings for work.—Before commencing work in any danger building all doors are to be unlocked and unbolted. Keys and locking bars are to be removed and hung up on the hooks provided, and bolts withdrawn and placed in the loops or secured by means of the pins provided. Leading workers are responsible that this is done.

Doors, when unlocked, are to remain closed or are to be fastened back. Danger buildings are not to be left unattended unless locked.

39. Footwear.—All workmen entering danger buildings are to put on the special footwear authorised before crossing the entrance barrier, leaving their own footwear outside the barrier. A reverse procedure is to be observed when leaving the building.

Danger building footwear is not to be deposited in any place where it can come in contact with dirt, grit or acid. It is to be examined by the leading worker before being put on at the commencement of the shift.

The special footwear provided (overboots, goloshes, etc.) for the use of officials is not to be worn by any person below the rank of assistant foreman. Before using the footwear all persons are to remove where possible any dirt from the trouser turn-up.

40. Sticks and umbrellas.—Sticks and umbrellas are not to be taken into danger buildings.

41. Danger building limits.—The leading worker of each danger building is responsible that the number of persons and the quantities of explosives do not exceed the limits posted up in the danger buildings.

No unauthorised person is to approach or carry out work of any nature in the danger building area.

42. Care in work.—All work in danger buildings is to be carried out in accordance with the Special Rules and Operating Instructions applicable to the process.

Persons employed in danger buildings are to carry on their work as carefully as possible. Should any operation appear to require the employment of unusual force it is to be suspended at once and the matter referred to higher authority.

Tools and implements are to be used with the greatest care and movements involving blows or friction are to be avoided. Articles are not to be thrown down or allowed to fall or drop on to the floor.

No person is to carry out experiments in danger buildings or with explosives without the authority of the Chief Superintendent.

Pieces of chalk, pencils and similar articles are not to be placed behind the ear. Such articles must be kept in the places provided when not in use.

43. Handling of explosives and explosives receptacles.—Explosives and their receptacles are not to be exposed to direct sunlight.

Receptacles and packages of all kinds for explosives, whether full or empty, are not to be roughly handled or dropped. They are to be lifted clear from place to place, and are not to be dragged along, pushed, put down carelessly or slid except on conveyors.

Receptacles are to be examined for cleanliness and freedom from foreign substances before explosives are put into them. Should any foreign substance be found in any receptacle containing explosives both are to be put on one side and the matter referred immediately to the leading worker or higher authority.

Bags are to be turned inside out for examination.

All explosives are to be kept covered except when work is being carried out on them or where the nature of the process precludes this.

Bags containing explosives are to be securely tied and boxes securely fastened before conveyance by truck.

44. Cleanliness.—The danger building platforms, floors and interiors of danger buildings, trucks, plant and machines are to be kept free from dirt, grit, and unnecessary accumulations of materials. In buildings where floors are kept dry, any water accidentally spilled on to the floor is to be mopped up immediately.

45. Upsetting or spilling of explosives.—In the event of the accidental upsetting or spilling of explosives on tram lines, platforms or other places outside danger buildings, the leading worker or higher authority is to be informed at once. No attempt is to be made to move the truck or to clear up the explosives until the assistant foreman or higher authority arrives to superintend. Approaching traffic is to be stopped until the site has been cleared.

46. Steam pipes.—Explosives are not to be placed within 2 feet, and wood or other inflammable substances within six inches, of steam pipes, boilers or ovens except when authorised by the scientist in charge.

47. Aluminium paint.—Aluminium paint is not to be used in danger buildings.

48. Internal combustion, C.I. or steam engines.—Apparatus operated by internal combustion or C.I. engines is not to be used within 30 yards of any building containing explosives, except by written permission of the Chief Superintendent.

On the approach of trucks containing explosives the engine is to be stopped.

Steam engines are not to approach within 75 yards of any building containing explosives, except by written permission of the Chief Superintendent.

49. Grass cutting.—Grass in the vicinity of danger buildings is to be cut at frequent intervals, and after cutting is to be removed as soon as possible. If, for any reason, cutting should not be possible, or if after cutting it should not be possible to remove the grass, during dry weather it is to be kept wet in the vicinity of the danger building.

50. Thunderstorms.—On the approach of a thunderstorm, the foreman will close down any danger building in accordance with the Special Rules for that building. The buildings vacated are to be secured until the storm has passed over. Danger building telephones are not to be used during a thunderstorm.

Traffic Rules

51. Explosives trucks.—Explosives trucks are only to be used for conveyance of explosives. They must be kept clean and examined before use.

Doors or loose flaps of explosives trucks are to be closed and fastened except when loading or unloading.

Trucks containing explosives are not to be left unattended except at the places approved for this purpose.

Bags containing explosives must be tied before putting them into trucks and must be so placed that the mouths are not facing outwards.

52. Packages in open trucks.—Cases, barrels, drums, cylinders, boxes or bags are not to project beyond or above the sides or ends of the trucks. Loads are to be adequately secured.

53. Movement of tractors and trucks.—Persons moving trucks by hand are to maintain a walking pace and are not to relinquish their hold of trucks in motion.

No person is to sit or ride on trucks or tractors except by permission of the assistant foreman or higher authority.

Rail trucks are not to be pulled or drawn by hand from the front except where it is necessary to pull them clear of the porches of buildings, etc.

All trucks are to give way to trucks loaded with explosives.

Empty trucks are to give way to loaded ones. Narrow gauge trucks are not to be lifted off the lines to allow others to pass.

Before taking trucks inside a traverse or porch of a danger building the trucker is to ascertain whether he may enter.

Rail tractors and trucks are to be kept to the left-hand tracks, and road trucks to the left-hand side of the road.

54. Points.—Persons in charge of trucks and tractors are to see that the trucks and/or tractors are clear of the points before the points are moved, and that they are not left standing over any points, or in any other position where they are liable to be fouled by other traffic.

Branch line points are to be altered after use to provide a clear course for traffic on the main lines.

55. Stationary trucks.—Trucks are not to be left standing on main lines.

Trucks are not to be left standing unless the brake is fully applied, or other steps taken to prevent movement.

Safety Regulations

AUTHORISATION OF BUILDINGS AND PLANT FOR EXPLOSIVES USE.

56. (a) In the event of a building being required for use, notification for the purpose of inspection is to be made to the Safety Officer. The intended use of the building, the name of the explosive and the amount, are to be supplied.
- (b) The Safety Officer will then inspect the building, and advise on its use for the purpose stated, or submit recommendations for its improvement.
- (c) The appropriate Superintendent will give final approval for the building to be used as required.
- (d) A building must not be taken into use for a purpose different from its previous use without approval of the appropriate Superintendent being first obtained.
- (e) All plant and equipment intended for use in connection with explosives must be examined by the Safety Officer before being taken into use.

SPECIAL RULES, OPERATING INSTRUCTIONS, USE LISTS, EXPLOSIVES AND MAN LIMITS.

57. In every danger building or proof stand there must be exhibited on a board:—

- (a) The limit by dry weight of explosive or ingredients allowed.
- (b) The Man Limit (this does not include scientific staff or visitors, but in the event of the leading worker considering that the work is in danger of being obstructed he may request some of the visitors to wait until the building is clear).
- (c) Special Rules for the safe conduct of the operation. These rules may be temporary in the event of the process being carried out under the control of a scientific officer. Permanent rules are to be prepared as soon as the process passes out of such control and are then to be submitted by the Head of Section for authorisation by the Superintendent concerned, through the Safety Officer.
- (d) Operating Instructions giving details of the method of carrying out the process.
- (e) Use List giving the items of moveable equipment permitted in the building in connection with the process.

58. If the process is in a trial stage, the Operating Instructions and Use List may be entered in a Log Book, but as soon as possible the Instructions and the Use List are to be exhibited on the board.

59. A Log Book (as mentioned in Rule 58) is to be maintained in every danger building and proof stand. Recordings, instructions, and temporary tools as required by the scientist in charge are to be noted therein.

60. (a) Alterations or additions to Special Rules and Limits as required are to be submitted on the appropriate form (Appendix G), stating if temporary or permanent, to the Superintendent concerned through the Safety Officer.
- (b) Such alterations or additions will be passed by the Safety Officer to the Superintendent, either on a temporary card which after authorisation will be exhibited in the house concerned, or if permanent will be authorised on a typed slip and then posted to delete the obsolete limit or rule and added to the existing rules.

61. Copies of the Special Rules etc., will be kept by the Safety Officer and Head of Section, who will be responsible for seeing that all amendments are duly posted in their copies.

62. Special Rules, etc., are to be kept in a legible condition.

CLEARANCE PROCEDURE IN DANGER BUILDINGS AND PROOF STANDS.

63. (a) Before any repairs (other than repairs provided for under emergency or minor repairs) are carried out in any part of a building, that part and the plant in it must be cleaned of all explosives as far as possible, and so certified on the appropriate certificate, Appendix A, which is to be kept in the building during repair.
- (b) The Safety Visitor will certify that, in addition to the plant being clear of explosives, it is also isolated from all sources of gas, acid, or inflammable materials, and that all sources of motive power are cut off either by removal of fuses, locking of switchgear or removal of belts, and that where applicable a notice "Do not start" is exhibited on the starting gear.

64. (a) In the case where certain plant requires partial dismantling before thorough cleaning can be carried out, such operations are listed in the Special Rules of the house. The plant must be washed through before dismantling takes place, and the exterior must also be clear of all explosives. No metal tool is to be applied to any piece of plant contaminated with explosives. All bolts should be sprayed with a penetrating oil before removal.

(b) While such dismantling is in operation, a process worker must stand by to remove any explosive which may be exposed, and all other work must stop until the explosive is removed. A tradesman is not permitted to remove explosive.

65. If a Safety Visitor is not fully satisfied regarding a particular part of the plant, such as a valve or pipe etc., being clean, this fact is to be noted on the reverse of the clearance certificate, and care exercised during the dismantling.

66. (a) All fitters are to be provided with a box for storing small parts of plant removed. These must not be allowed to lie about.

(b) Wherever possible safety tools are to be used.

67. Precautions must be taken to avoid damaging the floor. Waste gulleys are to be blocked to prevent the passing of grit, etc., into savealls.

68. Any plant found to be in any way contaminated is to be removed from the building and cleaned away from the scene of the repair in an approved place. Tools used for repair work must be passed as clean before removal from the building by the leading process worker.

69. The Safety Visitor is responsible for ensuring that the plant and building are thoroughly cleaned, and free from foreign material, and will complete the certificate to this effect. The scientist in charge will then satisfy himself that everything is in order before issuing instructions that the process work is to proceed.

70. (a) Any plant, pipes, motors, etc., which are to be removed for repair or salvage must first be certified as free from explosive or inflammable material by the scientist in charge, and a certificate (Appendix C) attached to the plant before removal. It is forbidden to work on any such plant unless the certificate is attached.

(b) If the scientist in charge is not fully satisfied regarding the clearance of such plant, he is to give detailed instruction for repairs, or if for salvage the plant must be passed to the burning ground for burning and then recertified by the scientist in charge. More than one burning may be necessary.

71. No plant is to be stored for possible future use until it is certified clean.

72. Second-hand pipework must not be cut by sawing, but roller cutters used, and before complete penetration is obtained the pipe is to be broken.

73. All lead after certification is not to be re-used but passed back to the chemical plumbers for melting under approved conditions.

EMERGENCY OR MINOR REPAIRS (EXPLOSIVES PLANT).

74. Where repairs or adjustments are necessary to enable normal manufacture to proceed, emergency or minor repairs may be carried out under the personal supervision of the scientist in charge or responsible person appointed by him.

75. (a) Where possible all explosives must be removed before commencing work. Plant must be thoroughly cleaned down, especially where it is necessary to use spanners or grips. All nuts should be sprayed with penetrating oil.

(b) Surrounding plant must be screened and if work is overhead, covering sheets placed underneath.

(c) The area should be marked off to prevent intrusion but not to hinder a quick exit.

(d) Waste gulleys should be blocked to prevent foreign matter entering savealls.

(e) No metal tool is to be applied to any part which is contaminated with explosives.

(f) A process worker is to stand by ready with a water hose or steam to remove any explosive exposed. A tradesman is not allowed to remove explosive from the plant. Any dirt or grit should be cleaned up as made.

(g) Any explosive exposed or removed must be taken away immediately and placed in a waste receptacle outside the building.

(h) The process worker must see that all small parts as removed are free from explosives and, if so, placed in a box. Any contaminated part is to be removed and cleaned away from the area of repair or alteration. No repair work is to be carried out on any part contaminated with explosives until cleaned.

76. (a) If the work undertaken is in connection with acid or if there is reason to apprehend the presence of dangerous fumes, a gas mask or breathing apparatus must be held ready.

(b) Further precautions may be considered necessary, and in every case the Safety Officer or Safety Visitor is to be advised and will arrange inspection to see that these precautions are being adopted and the scientist's instructions complied with.

77. Normal instructions regarding the isolation of acid, gas and power must in all cases be carried out. (Chem. Works Reg. No. 7.)

78. The plant must be thoroughly washed or cleaned down after repair.

CLEARANCE PROCEDURE FOR EXPLOSIVES PLANT FOR REMOVAL FROM EXPLOSIVES BUILDINGS.

79. Plant may be removed from a building for repair, scrap or salvage subject to the following precautions:—

(a) Plant for removal to a cleansing centre is to be cleaned to remove any explosives which may be dislodged during transit. Pipes and ducts should be blocked at the ends, and the lids secured during transit.

(b) Where no cleansing centre is installed then the plant must be thoroughly cleaned in the building. It should not be cleaned on a wooden platform or floor unless this is protected by a covering, *e.g.*, metal sheet or tray.

(c) If solvents are used in the cleaning, care must be taken to ensure that the building is well ventilated, and that solvent is not spilled on the floor. The use of solvents for cleaning should be avoided as far as possible owing to their toxicity and/or inflammability. During their use, explosives precautions must be observed, and thereafter no naked flame be permitted in the building until the atmosphere is free from vapour concentration.

(d) Before the plant is removed either from the cleansing centre, or building, it must be certified free from explosives by the scientist in charge who will sign the certificate (Appendix C), and securely attach it to the plant. Each item of plant must be labelled separately. Plant must be removed promptly from a building after certification.

(e) If the scientist in charge, or authorised deputy not below the rank of E.O., is not fully satisfied and requires the plant to be subjected to flame treatment, he is responsible for supervising such treatment or ensuring the plant is passed to the burning ground, and finally is to certify the plant clear and attach the certificate.

80. Tradesmen must not work on any plant unless it carries a clearance certificate. In the event of the certificates becoming mislaid, application must be made by the foreman tradesman to the scientist in charge for a new certificate, and work suspended until this is forthcoming.

BURNING, WELDING OR FLAMING OF PLANT AND EQUIPMENT.

81. Contaminated equipment of leather, timber, canvas etc., is not to be salvaged but destroyed by burning.

82. Only metal plant and equipment passed by the Engineering Department for salvage is to be passed through the fire.

83. Metal plant and equipment for re-use must be cleared of explosives by flaming operations at the cleansing centre, after removal of all explosives as far as possible by normal cleaning methods.

84. (a) Where it is not possible to remove plant or equipment, this must be certified to be as free as possible from explosive, and suitable precautions adopted as detailed by the Safety Officer on Form (Appendix F).

(b) Preliminary flame testing is to be carried out in the presence of a Safety Visitor before the flame is used in the normal manner.

(c) Where any solvent, inflammable or otherwise, has been used in or for cleaning plant or equipment to be welded, it is essential that this is noted on the application for a Fire Pass, and the scientific officer in charge must ensure that the plant is thoroughly steamed, filled with water where possible and then emptied before any flame is applied.

- (d) A process worker must be in attendance with a running hose during the operation, and wherever possible the floor and walls must be thoroughly wetted.

REPAIR OF PLANT (OTHER THAN EXPLOSIVE) WHERE DANGEROUS GAS OR FUME MAY BE PRESENT.

(Chemical Works Reg. No. 7.)

85. Chemical Works Regulation No. 7 states that where any person, other than for rescue purposes, enters any tank, tower, or any other place where there is reason to apprehend the presence of dangerous gas or fume, a certificate must be completed stating either:—

- (a) That the place has been examined personally by a responsible person who certifies in writing in a book kept for the purpose that such place is isolated and sealed from all source of gas or fume and is free from danger; or
- (b) That it is not so isolated and free from danger and no person shall enter unless he is wearing a breathing apparatus and a life belt (provided there are no cross stays or obstructions likely to cause entanglement), the free end of which shall be attached to a rope left with a man outside, whose *sole* duty is to keep watch and arrange to draw the wearer out immediately if he appears to be affected by gas or fume.

In practice the word "place" is given a wide interpretation to include such places as an acid pump house, storage tank (open type).

A responsible person is the Head of Section or authorised deputy not below the rank of Experimental Officer.

86. (a) Whenever possible an enclosed vessel or place must be isolated and sealed from every source of gas, fume, or motive power, and made free from danger before anyone is allowed to enter.
- (b) Analysis for toxic gases applicable must be made in the vessel or place not more than one hour before anyone is allowed to enter. If there is reason to suspect the presence of inflammable gas from solvents or leakage, tests must be made and appropriate action taken.
- (c) Chemical Works Regulation Certificate (Appendix E) must be completely filled in and signed by the certifying scientist when his examination has been made.
- (d) The certifying scientist must enter and examine the vessel within 10 minutes of work being commenced in the vessel.

- (e) The procedure stated in Rule 86 (a), (b), (c) and (d), must be re-confirmed and carried out at the beginning of each shift whilst work is being done and whenever work recommences after an interval sufficiently long as to make the composition of the atmosphere in the vessel uncertain.
- (f) Work must immediately cease and a re-inspection made if any complaint is made by the workman.
- (g) Any person entering the vessel must wear a safety belt to which a rope is securely attached the free end being held by a person outside, and where possible an escape ladder is to be provided.
- (h) Where possible a continuous fresh air supply is to be blown into the vessel or place.
- (i) Breathing apparatus is to be immediately available in the close vicinity.

87. Where there is a possibility of Arseniuretted Hydrogen being evolved during the cleaning out of any plant, *e.g.*, those used for sulphuric or hydrochloric acid, non-metallic scrapers and pails must be used (Chemical Works Reg. 9).

REPAIR OR MAINTENANCE TO NON-EXPLOSIVES PLANT OR TO PLANT NOT IN ANY PLACE WHERE THERE MAY BE DANGEROUS FUME OR GAS

88. The Section in normal control will arrange for the isolation of machinery from all sources of motive power either by removal of belts, removal of fuses or by locking of switch-gear, and will exhibit notices on the starting boxes, "Do not start."

89. If the work is on acid pipe lines, valves or other plant connected to sources of acid or other dangerous substances, the valves on each side are to be closed and locked if possible, and a notice "Do not start" placed on the valves. A hose pipe is to be kept running in the near vicinity.

90. (a) The Head of Section or his authorised deputy will then pass a certificate (Appendix D) to the Service Section, and state on the form if extra precautions will be required, *e.g.*, wearing of goggles, gloves, the possibility of acid being in the pipe lines, or the desirability of removing sections of pipes and fitting blank flanges.

- (b) The certificate will be held by the leading worker of the repair crew on the job until work is completed when he will sign the form and return it to the Section in normal control. No tradesman is to carry out repairs or maintenance on any plant or machinery unless a certificate is passed to the leading worker in charge of the job.
- (c) These certificates must be completed for each different job being done and whenever plant (except where the D.B. clearance certificate (Appendix A) operates) is handed from one group to another, *e.g.*, Engineering Dept. to Building Works Dept., or Plumbers to Electricians, etc.
- (d) The certificates must be re-confirmed by the submitting Section each day if work is in operation for more than one day.
- (e) These certificates will be retained in the Section Office for a period of 12 months before destroying.

SALVAGE

91. Plant or metal passed to the Engineering Department and agreed by them for salvage purpose must be certified as free from explosives, acid or dangerous liquid (Certificate, Appendix C). The Engineering Department will not accept plant unless it carries a certificate to this effect.
92. Lead work, after certification, will be passed to the chemical plumbers for melting under approved conditions.
93. Before any salvage plant or metal is allowed to leave the factory, a clearance certificate is to be obtained from the Safety Officer or Safety Visitor, and passed to the Stores before the Property Pass is completed
94. Salvage dumps are the responsibility of the Engineering Department.

STORAGE OF EXPLOSIVES, AMMUNITION AND CHEMICAL WARFARE STORES.

95. For the purpose of storage, explosives, ammunition and chemical warfare stores are grouped into 15 groups, and these groups should as far as possible be stored separately.

Where accommodation will not permit all groups to be stored separately, the following groups may be stored together as shown :—

- (a) Groups I, Ia, II and IV, under magazine conditions only.
- (b) Groups V, VI, VIII, X.
- (c) Group VII and safety cartridges from Group VI.
- (d) Groups IX and XI.
- (e) Groups III, XII, XIII and XV must always be stored in separate buildings.

Group I consists of stable explosives bearing an explosion risk and liable to function by spark or friction but not containing their own means of ignition, *e.g.*, R.D.X., C.E., R.D.X.-T.N.T., Pentolite, etc.

Group Ia. Highly sensitive explosives in bulk only, *e.g.*, Cap compositions, lead azide, etc.

Group II. Explosives liable to decomposition bearing an explosion risk and liable to function by spark or friction, but not containing their own means of ignition, *e.g.*, cordite (granular or flake), dry guncotton, dynamite, etc

Group III. Explosives liable to decomposition, bearing a fire risk but not containing their own means of ignition, *e.g.*, cordite, except granular and flake, etc.

Group IV. Stable explosives bearing a fire or explosion risk but not containing their own means of ignition, *e.g.*, T.N.T., P.E., etc.

Groups V, VI, VII, VIII and XV refer to various classes of filled ammunition.

Groups IX and XI refer to pyrotechnics and incendiary ammunition.

Group X refers to detonators.

Group XII refers to ammunition containing white phosphorus.

Group XIII refers to chemical ammunition.

96. Magazines will be under the supervision of the Stores Chemist and reference should be made to him regarding storage.

97. Separate stores will be maintained for chemical laboratories where small quantities of explosives are required, and these stores will be under the supervision of the scientist in charge of the laboratory.

TRANSPORT OF EXPLOSIVES.

98. **Internal Transport.**—The internal transport of explosives is subject to the Traffic Rules and the Special Rules applying to trucks. These Special Rules will be detailed for each explosive and until so detailed no transport will be allowed. Special Rules will be drawn up by the Safety Officer and authorised by the Chief Superintendent.

99. External Transport (Road).—

- (a) Only the type of vehicle approved by the Safety Officer is to be used, and only explosives approved by him are to be carried.
- (b) The interior part of the vehicle for carrying the load is to be cleaned free from grit, oily rags, waste or other combustible material.
- (c) No vehicle is to carry more than 10,000 lbs. net of explosive. The limit in each case will be laid down by the Safety Officer.
- (d) Each package is to be marked in the following manner :
 - (i) Class of explosive.
 - (ii) Type of explosive.
 - (iii) Station monogram or address of consignor.
 - (iv) Address of consignee.
- (e) Wherever possible the load of each vehicle shall consist of explosives of one group only, except that to secure a full load, the load may consist of explosives of any or all groups excepting Groups Ia, XII and XIII.
- (f) All packages are to be well secured and are to be protected from weather, pilfering or sabotage.
- (g) The engine must be stopped during loading or unloading or whilst filling with fuel.
- (h) No smoking is allowed during loading or unloading.
- (i) The loading or unloading must be carried out without interruption. In wet weather packages of explosives are to be kept dry.
- (j) The driver is to be fully informed as to his conduct during the journey and the address and telephone number of the consignee.

- (k) No frozen explosive is to be handled without special instructions from the scientist in charge.
- (l) The person responsible for loading or unloading will ensure that the above rules are carried out.

BULK STORAGE AND USE OF SOLVENTS.

100. (a) All solvents in bulk are to be kept in a store specially provided for the purpose.
- (b) Inflammable solvents are to be kept apart and the area of storage so labelled.
 - (c) The opening of drums is to be carried out in the open air or with doors and windows open to prevent toxic and/or inflammable concentrations of vapour arising.
 - (d) Inflammable solvents are to be opened only with the non-ferrous key provided. In event of this failing a wooden hammer may be used to assist unscrewing. Footwear free from iron or steel must be worn.
 - (e) A detachable earthing clip should be attached at the Solvent Store to drums in use to prevent the building up of static charges during filling of smaller vessels.

101. Drums which have contained solvent must not be used for any other purpose until they have been certified as clear by the Head of Section, or authorised deputy not below the rank of E.O., or by the Safety Officer. Such drums must not be heated by application of a flame, etc., without the special authority of the Safety Officer.

102. Solvents are only allowed into danger buildings in accordance with the Special Rules. Solvents must be kept in a marked container approved by the Safety Officer.

103. The use of solvents for cleaning plant should be avoided as far as possible, and on no account is a naked light to be allowed in a building where an inflammable solvent has been used until the Head of Section or authorised deputy not below the rank of E.O., has certified that the building is clear of inflammable vapour.

104. Solvents must only be used in a well ventilated building.

105. Care must be taken to avoid the spillage of solvents, and trays should be provided for holding solvent containers.

106. Rags and waste contaminated with solvents must be removed from the building as soon as possible after use, and placed in the metal bins provided.

DISPOSAL OF WASTE EXPLOSIVES, SOLVENTS ETC.

107. Waste explosives, solvents and empty glassware should be segregated into approved categories as directed by the Safety Officer and a separate container maintained for each category.

108. The disposal of waste explosives and solvents forms one of the Special Rules exhibited in each house.

109. The waste is to be conveyed in a closed container appropriately marked "WASTE and TYPE THEREOF" to the Central Waste collecting station for the area and then deposited in the container similarly marked.

110. The burning ground attendant will visit each central collecting station daily and collect waste, conveying this by truck, clearly marked "WASTE ONLY." This truck must only be used for the collection of waste.

111. The attendant is responsible for keeping the waste station clean, and for seeing that a supply of waste containers is always available.

112. The attendant will remove the waste to the burning ground, ensuring that rags, broken boxes, glassware etc., are kept separate from explosives, and carry out the burning in accordance with the Special Instructions exhibited at the Burning Ground.

REGISTERS TO BE KEPT IN ACCORDANCE WITH THE REQUIREMENTS OF THE FACTORIES ACT (1937).

113. Chains, rope, lifting tackle (Sec. 23).—

- (a) Shall be examined by a competent person at least once in every 6 months and a register containing the prescribed particulars kept.
- (b) No new chains, rope or lifting tackle shall be taken into use unless previously tested by a competent person and a record of such test made in the register.
- (c) Chains and lifting tackle, except rope slings, shall be annealed at least once in every 14 months: chains or slings of $\frac{1}{2}$ in. bar or less, once in every 6 months. If not in regular use annealing is required only when necessary (a record is to be kept).

114. Cranes and other lifting machinery (Sec. 24).—

- (a) Shall be examined by a competent person once in every 14 months and a register kept.
- (b) As with 113 (b) above.
- (c) Safe working loads must be plainly marked on the machine.

115. Hoists and lifts (Sec. 22) —

- (a) Shall be examined by a competent person at least once in every 6 months and particulars kept in a register.

116. Steam boilers (Sec. 29).—

- (a) Shall be examined by a competent person at least once in every 14 months and after any extensive repairs.
- (b) Examination is to be carried out in accordance with the requirements of the Act and a report kept in the prescribed register.
- (c) New boilers require a certificate from the manufacturers.

117. Air and steam receivers and steam containers (Sec. 30 and 31).—The above are to be examined by a competent person at least once in every 26 months and a report made on Forms 59 or 58 and kept in the register.

118. (a) Testing under Sec. 23 (Chains, ropes, etc.) and Sec. 24 (Cranes) will be carried out by the Engineering Department in accordance with specifications supplied by the Safety Officer.

(b) Hoists and lifts will be examined by the Engineering Department.

119. The examination in respect of steam boilers, receivers, containers, and air receivers will be carried out under contract by the Insurance Inspector.

120. The Engineering Department are responsible for the maintenance of the above records.

ISSUE OF LIFTING TACKLE AND LADDERS.

121. The issue of lifting tackle and ladders will be made by the Foreman in charge of the Tackle Stores, who is responsible for their recall for testing and maintenance.

122. Issues to Sections will only be made on written requests specifying requirements.

123. The tackle is not to be used to lift weights greater than the safe working load shown on the tackle.

124. The Head of the Section will be responsible for seeing that :—

- (a) The tackle is kept in good order.
- (b) Ropes are not used in the presence of acid or acid fumes
- (c) Ladders do not remain about the plant longer than is necessary, but are returned to the Section Store after use.
- (d) Any defect is at once reported to the Foreman of the Tackle Stores.
- (e) Tackle is at once returned on the request of the Foreman of the Tackle Stores.
- (f) Fixed tackle is not removed without the permission of the Foreman of the Tackle Stores.

FENCING AND GUARDING OF MACHINERY, PITS AND VESSELS.

(Factories Act, 1937.)

125. Machinery, whether prime movers, transmission gear or otherwise, shall be fenced and/or guarded so as to render the machine safe to work. All pits and vessels containing dangerous liquid (hot water is considered dangerous) must be either closed in, or adequately fenced to a height of 3 feet above the ground or the platform surrounding.

126. Foremen are to ensure that all guards and fences are securely in place on all machinery before use.

127. The Safety Officer is to be consulted regarding the adequate guarding and/or fencing of machinery. He is to inspect all running machinery every month.

PORTABLE ELECTRICAL ENGINEERING EQUIPMENT.

128. The following procedure will be adopted as regards all portable electrical engineering equipment such as drills, hammers, grinding wheels, lamps, grinding attachments, etc., having flexible leads :—

- (a) No new portable electrical equipment shall be put into service until it has been inspected by the Engineering Department Electrical Section, who will attach a certificate authorising its use for the next three months.
- (b) The user will hold the certificate and will be responsible for the return of the equipment to the Engineering Department Electrical Section every three months for further inspection and renewal of the certificate.

- (c) Any cable leads used with the equipment will be returned and inspected at the same time.
- (d) Should any defect develop between times of inspection, the user will immediately return the equipment to the Electrical Section for attention.

TOOLS.

129. (a) Worn tools, mushroomed-headed chisels, split handles, etc., are not to be used. The fact that the tools may be the personal property of the tradesman does not permit their use if they are in a dangerous state.
- (b) The foreman in charge of each department, e.g., Machine Shop, Electricians, Plumbers (Chemical), Woodworkers, etc., is responsible for carrying out a monthly inspection and rejecting such tools as he considers dangerous.
- (c) A certificate is to be rendered on the last working day of each month to the senior engineer (maintenance) that the inspection has been carried out.

CYLINDERS AND DRUMS OF LIQUEFIED OR COMPRESSED GASES.

130. (a) Cylinders or containers must be handled carefully and must not be dropped or bumped.
- (b) Valves and cylinders must be kept clean, and valve sockets must be "snifted" before attaching any fitting to ensure that they are free from loose dirt.
- (c) Cylinders must be strapped to a bench or carrier and stand in a platform or well base when in use.
- (d) Cylinders or containers must not be stored near heat or combustible materials, or in places where corrosion or contact with oil and grease is likely.
- (e) Gauges showing pressures other than those recommended by the gas suppliers must not be used.
- (f) Valves or gauges should be tested for leakage. Tests should be carried out if required by applying soap solution to the valve socket and gland nut; naked lights or flame must not be used.

SAFETY APPLIANCES.

Chemical Works Regulations (No. 6) requires that a sufficient supply of :—

- (a) Breathing apparatus.
- (b) Oxygen and suitable means for its administration.
- (c) Life belts.

shall be provided where dangerous gases or fume is liable to escape.

Gas and dust masks.—

131. (a) Gas masks must be worn before entering a building where there may be a *light* concentration of gas or fume.
- (b) Gas masks and canisters are to be provided wherever there is a liability of dangerous gas or fume arising. These masks will be inspected weekly by the Safety staff and replaced if necessary.
- (c) After the gas masks are used the Foreman is responsible for obtaining replacements from the Safety Officer; these must be installed before the process is re-commenced.
- (d) In any process where a dust or other impurity likely to be injurious is given off, suitable masks are to be worn (Factories Act, Section 47).

Breathing apparatus.—

132. If the concentration of gas or fume is heavy, Salvus breathing apparatus must be used.

133. (a) Salvus apparatus and replacement oxygen cylinders are to be kept as under :—
- 2 sets. Hose House No. 13, near R.D.X. Nitration House.
 - 2 sets. Hose House next N.G. Office (Hopplit Station).
 - 2 sets. Fire Station (Hopplit Station).
 - 2 sets. Fire Station (Quinton Station).
- (b) The Fire Brigade Officer will inspect all Salvus equipment at least once a month and record a report of their condition in a book kept for that purpose.
- (c) The Fire Brigade Officer will also be responsible for training and practising such staff as are considered necessary in the use of Salvus apparatus.

134. Gas casualties are not to be allowed to walk but must be taken by stretcher or ambulance to the hospital for treatment.

Baths, goggles, gloves, etc.—

135. Where grit or foreign substances may be ejected by force—*e.g.*, grinding operations, chipping of bricks, etc., protective goggles must be worn.

136. (a) Where strong acids or dangerous corrosive liquids are used and injury through splashing or otherwise is possible, safety baths, eye wash bottles, goggles and rubber gloves are to be provided.
- (b) The Foreman is responsible for seeing that :—
- (i) The gloves are collected, cleaned and examined each day, and repaired or renewed as necessary.
 - (ii) Eye wash bottles are provided and kept filled with distilled water in a clearly marked cabinet.
 - (iii) Safety baths are kept filled with clean water.
- (c) Acid proof clothing is to be kept in the Foreman's office for use where there is an escape of dangerous liquid, *e.g.*, acid, ammonia.

Breathing apparatus is to be worn underneath this clothing.

137. First Aid boxes distinctly marked are to be provided in the Foremen's offices and laboratories. The person in charge of these boxes is responsible for ensuring that they are checked over weekly and replacements obtained from the Surgery.

138. Life belts will be issued from the Safety Office as required.

SAFETY PRECAUTIONS FOR LABORATORIES.

139. Separate laboratories or parts thereof are to be allocated for work on different types of explosives.

140. As small an amount of explosives as possible should be brought into the laboratory at one time. Explosives must not be left uncovered.

141. Solvents and explosives are to be removed as far as possible at the end of the day to their appropriate store, where they are to be kept under clean conditions. Solvents are not to be kept in the same store as explosives, but a separate store maintained.

142. Filters and/or catchpots are to be fitted in sinks to prevent the passing of explosives into drains. The filters will be cleaned out daily and the waste disposed of according to the laboratory instructions.

143. Acid should be returned to the plant as far as possible, but if poured into the sinks must first be thoroughly diluted.

144. Separate receptacles containing just enough water for complete covering of the contents must be kept for H.E. and propellant waste, and these are to be kept covered, away from possible contact with acids or alkalis, and removed to the central waste collecting centre daily. No initiating explosives are to be placed in the waste receptacles but are to be dealt with in accordance with the special regulations laid down by the scientist in charge.

145. Solvents are to be clearly labelled and are to stand in metal trays to prevent dripping on to the floors.

146. Waste solvents are to be returned to containers clearly labelled "WASTE . . ." and these containers are to be emptied at regular intervals into waste solvent containers at the central waste collecting centre for burning, unless recovery has been authorised by the scientist in charge. Waste solvents are not to be kept in bottles fitted with ground glass stoppers or cocks.

147. Bottles containing acid are only to be conveyed in the special carriers provided.

148. Solvent drums are only to be opened under non-sparking conditions with the non-ferrous tools provided.

149. Special Rules regarding limits, conduct of operations, face protection, wearing of goggles or gas masks and toxicity, will be issued in writing by the scientist in charge in respect of each programme. Unauthorised experimental work is forbidden.

150. All fire appliances are to be kept in good order and ready for use.

151. All gas burners are to be extinguished when not required and the main supplies to the building turned off at cessation of work each day, except when required for special work when the Temperature Recorders are to be advised.

PROCEDURE IN CASE OF FIRE DURING WORKING HOURS.

152. The person first discovering a fire will summon anyone working in the vicinity to his aid and endeavour to put it out. If unable to extinguish the fire IMMEDIATELY he will operate the nearest fire alarm or telephone the switchboard operator.

153. The senior person present at the scene of the fire will take charge until the arrival of the Fire Brigade and will see that immediate steps are taken to extinguish the fire with the emergency apparatus available.

154. If the fire involves organic solvents, oils or other liquid combustible material immiscible with water, WATER must NOT be used. Sand, earth, foam extinguishers, blankets or rugs only will be used in such cases.

155. Water must not be directed on to electric wires or apparatus.

156. If more than small quantities of explosives are present in the immediate vicinity of the fire and are likely to be involved, all persons in the neighbourhood are to be warned to take cover. Measures taken to extinguish the fire will be conducted from behind cover. No one is to enter the building or traverse without permission from the senior official present.

157. To avoid the spreading of the fire the following steps will be taken :-

- (i) Gas or electricity will be at once cut off from the building in which the fire has occurred.
- (ii) All doors and windows in the vicinity will be closed.
- (iii) All inflammable material will, as far as possible, be removed from the immediate neighbourhood.

158. When the local fire alarm is sounded all auxiliary firemen will at once report to their area assembly point and await instructions.

ACTION IN CASE OF SERIOUS ACCIDENTS.**Action by the senior person present.—**

159. (a) Arrange to TELEPHONE the switchboard operator requesting ambulance and/or Fire Brigade, and if necessary for First Aid to be rendered.
- (b) Dispatch workmen to fetch stretcher, and, if required, rail ambulance carriage.
- (c) Arrange for the senior worker present to prepare best position for ambulance or stretchers.
- (d) Arrange for nothing to be disturbed apart from the necessary rescue work.
- (e) Arrange for the Foreman to take a roll call.
- (f) Telephone the Superintendent of the branch.

Action by the switchboard operator.—

160. (a) If the ambulance is required at the Hoppit Station arrange for it to proceed to the Main Office.
- (b) If ambulance is required at the Quinton Station, arrange for it to proceed by the factory road to the point nearest the scene of the accident.
- (c) Advise the Surgery to expect casualties.
- (d) Advise the Safety Officer or deputy.

**APPENDIX A.
DANGER BUILDING CLEARANCE CERTIFICATE.**

Building.....Section
Nature of work.

B.W.D.
Electrical
Machinery
Plumbers

Safety Visitor.

All explosives have been removed and plant isolated.

.....19.....
Foreman.

Scientist-in-charge.

Safe for work to proceed except as noted overleaf.

.....19.....
Safety Visitor.

Foreman (Trades Section).

You are authorised to commence work at once, subject to the precautions noted overleaf.

.....19.....
Scientist-in-charge.

Scientist-in-charge.

Work completed.

.....19.....
Foreman (Trades Section).

Scientist-in-charge.

Plant, machinery and building thoroughly cleaned and ready for operation

.....19.....
Safety Visitor.

Building and plant ready for operation.

.....19.....
Scientist-in-charge.

APPENDIX B.

RULE READING CERTIFICATE.

Safety Officer.

I certify that the rules and amendments as advised have been read to all workers present under my control.

.....19.....

Foreman.

APPENDIX C.

.....Section.

Certified that the plant attached (description)

is free from explosive and/or acid and/or dangerous liquid and is ready for repair/disposal.

Date.....

APPENDIX D.

CLEARANCE CERTIFICATE FOR REPAIR OF PLANT.

Serial number.....

Certified that:—

Chemical Works Regulation No. 7.
(i) DOES APPLY to this job and the person handing over has seen the signature of the Responsible Person in the Special Book. Regulation 7, Certificate No.....

(ii) DOES NOT APPLY.
(One of the above statements must be struck out).

(a) The Machine or vessel is isolated from every dangerous source of gas and liquid and motive power.
(b) The machine or vessel is not isolated from every dangerous source of gas and liquid and motive power. Any special precautions to be taken are detailed below.
(One of the above statements must be struck out).

Signature.....Date.....Time.....
(Person handing over).

SECTION OF PLANT

HANDED OVER.

Job to be done and special precautions to be taken.

Signature of Parties concerned.

Date _____
Time _____
Renewed _____
Date _____
Time _____
Renewed _____
Date _____
Time _____
Renewed _____
Date _____
Time _____

HANDED BACK.

Particulars of Job done.

Signature of Parties concerned.

Date _____
Time _____

IF Chemical Works Regulation No. 7 applies, the person taking back the plant after completion of the job MUST NOTIFY the Responsible Person (see (i) above) that the job is complete and this clearance certificate is signed off.

**APPENDIX E.
CHEMICAL WORKS REGULATIONS, 1922.**

Regulation 7. Certificate No.....
Certified that the under-noted place which requires to be entered and in which there is reason to apprehend the presence of dangerous gas or fume :—

- (a) Is isolated and sealed from every source of such gas or fume and is free from danger.
- (b) Is not so isolated and sealed from every source of such gas or fume and free from danger, and therefore must not be entered by any person unless he is wearing a "breathing apparatus" and (where there are no cross-stays or obstructions likely to cause entanglement) a "lifebelt," the free end of the rope attached to which shall be left with a man outside whose sole duty shall be to keep watch and to draw out the wearer of the lifebelt if he appears to be affected by gas or fume.

(Either (a) or (b) must be crossed out in full.)

Particulars of place referred to :—

Date and time.....
Signature,
(of responsible person appointed for the purpose).

Renewed :

Date and time..... Initials.....

Renewed :

Date and time.....

Renewed :

Date and time.....

Renewed :

Date and time.....

COMPLETION OF JOB : This Regulation 7 Certificate is
hereby cancelled.

Date and time..... Signature.....

APPENDIX F.

Safety Officer. PERMANENT
APPLICATION FOR TEMPORARY FIRE.

Date	Time	Place	Method of Lighting	To be Lighted by	To be Extinguished by
Have solvents been used for cleaning purposes :—					
Special precautions :—					
Approved _____ 19____					
Head of Section					
for Superintendent					
I certify that the fire has been extinguished.					
_____ 19____					
Head of Section					
Note :—This authority should be returned to the Safety Officer, immediately after the completion of the service for which the fire is authorised.					

APPENDIX G.

Safety Officer.

The following **TEMPORARY** alterations in (limits) are
PERMANENT (use lists)

required in..... house, section, for the

purpose of

Limits :—

Explosives.

Use Lists :—

Workmen.

Rules.

Head of Section.

Superintendent,

Forwarded.

Safety Officer.

Safety Officer.

Approved.

Superintendent.

Head of Section,

Please note.

Safety Officer.

Safety Officer.

Noted and arranged.

Head of Section.

APPENDIX H.
BRITISH STANDARD IDENTIFICATION COLOURS FOR
GAS CYLINDERS, EXCLUDING CYLINDERS FOR
MEDICAL PURPOSES.

Gas	Ground Colour of Cylinder	Colour of Bands
Acetylene	Maroon	None
Air	Grey	None
Ammonia	Black	Red and Yellow*
Argon	Blue	None
Carbon Dioxide, for temperate use	Black	None
Do. for tropical and marine use	Black	White or alum- inium paint
Carbon monoxide	Red	Yellow
Chlorine'	Yellow	None
Do. cylinders fitted with inter- nal dip pipes'	Yellow	Black
Coal Gas	Red	None
Ethyl Chloride, inflammable... ..	Grey	Red
Do. non-inflammable	Grey	None
Ethylene	Mauve	Red
Helium	Medium Brown	None
Hydro-cyanic Acid	Blue	Yellow
Hydrogen	Red	None
Methane	Red	None
Methyl Bromide	Blue	Black
Methyl Chloride, inflammable	Green	Red
Do. non-inflammable	Green	None
Neon	Medium Brown	Black
Nitrogen	Dark Grey	Black
Oxygen	Black	None
Phosgene	Black	Blue and Yellow*
Sulphur Dioxide	Green	Yellow

* The red or blue band shall be placed adjacent to the valve fitting and the yellow band between that and the ground colour of the cylinder.

APPENDIX I.
COLOUR CODE FOR IDENTIFICATION OF PIPING.

	Colour	Flange	Mark	Service
DANGEROUS	Red	Red	—	Steam, Saturated
	Red	Red	White	Steam, Super-Heated
	Red	Red	Black	Steam, Domestic
	Black	Red	—	Steam, Exhaust
	Orange	—	—	Acids
	Yellow	—	—	Acids
	Green	—	—	Gases
	Violet	—	—	Valuable Chemicals e.g., Essential Oils and Fatty Acids etc.
SAFE	Sky Blue	Sky Blue	—	Water, Cold
	Sky Blue	Red	—	Water, Hot
	Sky Blue	Sky Blue	White	Water, Filtered
	Sky Blue	Sky Blue	Black	Water, Circulating
	Sky Blue	Violet	—	Hydraulic
	French Grey	French Grey	—	Refrigeration
	White	Violet	—	Compressed Air
	White	White	—	Ventilation Pipes
	Brown	Brown	—	Oils (Lubricating)
	Brown	Red	—	Oils (Fuel)
	Vermillion	Vermillion	Vermillion	Fire Services'

Based on B.S.S. No. 3011 "Identification of Engine Room Pipe Lines" (1929) and U.S.A. Standard A.13 (1923).
S. No. 186.

INDEX

	Page No.	Rule No.
A		
Access to dangerous places ...	28	125
Accident serious, procedure ...	34	159
Acid proof clothing ...	31	136 (c)
Administrations of rules ...	4	1-4
Air Receivers ...	27	117
Alteration to Limits, Special Rules ...	15	60
Alterations, repairs (Danger Buildings) ...	15	63-75
Aluminium paint (not to be used)	12	47
Approach to Danger Buildings...	12	48
Area, definition of ...	5	8
Articles, prohibited ...	6	11
Assistant Foremen (duties of) ...	—	2, 16, 18, 28, 34, 45, 50, 53, 80, 126, 129, 131, 136
Authorisation for taking over buildings ...	14	56
B		
Bags, containing explosives to be tied ...	11	43
Baths, safety ...	31	136
Belts, or revolving shafting ...	8	29
Blows or friction to be avoided in handling explosives ...	11	42
Boots and Shoes (danger buildings) ...	10	39
Breathing apparatus ...	30	132
C		
Care in work ...	10	42
Chains, lifting tackle, etc. ...	26, 27	113, 121
Chemicals (prohibited) ...	6	11
Chemical plant (repair of) ...	20	85-90
Chemical Works (Clearance Certificate) ...	38	Appendix E

	Page No.	Rule No.
Cleaning of machines in motion (prohibited)	9	29
Cleaning of trucks	11	44
Cleaning or Repair Work (Explosives plant)	15	63-73
Cleaning or Repair Work (Chemical plant)	20	85-87
Cleaning or Repair Work	21	88-90
Cleanliness of (Danger Buildings)	11	44
Cleanliness (Explosives receptacles)	11	43
Cleanliness (Factory)	8	24
Clearance Certificates	—	Appx. A, C, D and E
Clearance procedure, Danger Buildings	15	63-73
Clearance procedure for explosives plant	18	79
Cleansing centres... ..	18	79
Closing of buildings	7, 12	20, 50
Compression ignition engines	7, 12	15 (a), 48
Colour code (piping)	42	Appendix I
Conduct in factory	7, 8	17, 22
Containers for cotton waste and sponge cloths	8	25
Contraband, possession of	6	11
Covers to be kept on explosives receptacles	11	43
Cranes, etc.	27	114
Cylinders (liquefied or compressed gases) rules for	29	130
Cylinders (for liquefied or compressed gases—colour code)	41	Appendix H
D		
Danger Building (footwear)	10	39
Danger Building (definition)	5	6
Danger Building Rules	10	38-50
Danger Building Clearance certificate	35	Appendix A
Danger Building, cleanliness	11	44
Danger Building, footwear	10	39
Danger Building Limits, Special Rules	14	57-62
Danger Building, opening for work	10	38
Danger Building, repairs... ..	15	63-73

	Page No.	Rule No.
Danger Building repairs (emergency)	17	74-78
Danger Building searching	6	12
Danger Building Tools	11	42
Dangerous articles prohibited	6	11
Dangerous conduct	7	17
Dangerous places, access to	9	29, 32
Defective lamps, replacement	8	23
Definitions	5	5-9
Depositing of food	6	14
Disconnecting pipe lines	9	33
Disposal of waste explosives and solvents	26	107-112
Doors of buildings in use... ..	10	38
Driving belts and machinery in motion	9	29
Drums (solvents)	25, 32	100, 102, 148
Dust masks	30	131
E		
Economy in use of materials	8	26
Electric and gas fittings	8	23
Electric equipment (inspections)	8	23
Electrical equipment (portable)	28	128
Entering and leaving building	7, 10	20, 38
Entering Station	6	10
Exits from building	7	19
Experiments in danger buildings not permitted	11	42
Explosives and explosives receptacles	11	43
Explosives spilled	11	45
Explosive trucks (rules for)	12	51
Eyebottles, use of	31	136 (a)
Eyeshades and goggles to be worn	10, 31	37, 135
F		
Factory cleanliness	8	24
Failure of electric lighting	8	23
Fencing of pits and guards to be used	8	29
Fire Brigade Officer (duties of)	30	133
Fire fighting rules	33	152-158
Fire fighting equipment	8	27
Fire Pass (application for)	39	Appendix F

	Page No.	Rule No.
Fire Pass (authorisation for) ...	7	15
Fires, definition of ...	7	15 (a)
First Aid equipment and staff ...	8	28
Flaming procedure ...	19	81-84
Floors (care of) ...	16	67
Food, consumption of ...	6	14
Food, depositing of ...	6	14
Footwear (danger building) ...	10	39
Forbidden articles ...	6	11
Foreman, duties of ...	—	2, 16, 18, 28; 34, 45, 50, 53, 80, 126, 129, 131, 136
Foreman, Tackle Store, duties of	27	121-124
Frozen explosives ...	25	99 (k)
G		
Gas and electric fittings ...	8	23
Gassing casualties ...	10, 30	36, 134
Gas cylinders (colour code) ...	41	Appendix H
Gas, use of ...	30	131
Gas masks' ...	30	131
Glassware, broken ...	26	107
Grasscutting ...	12	49
Gloves to be worn ...	31	136 (a)
Goggles to be worn ...	10, 31	37, 135
Guards and fencing to be used ...	8	29
Guarding of belts ...	28	125-127
H		
Handling of explosives and recep- tacles ...	11	43
Heating pipes ...	12	46
Hoists and lifts ...	27	118 (b)
I		
Inflammable liquids, and drums containing ...	25	100-106
Infringement of rules ...	4	4
Inspection of buildings, before closing ...	7	20
Inspection, repairs, alterations danger buildings ...	15	63-73
Instructions Operating, for danger buildings ...	14	57-62
Interference with factory equip- ment ...	8	22

	Page No.	Rule No.
Internal combustion or steam engines ...	12	48
Irresponsible conduct ...	7	17
Issue and return of ladders, scaffolding, and lifting gear	27	121-124
K		
Keeping of rule book ...	4	1
Keys ...	7	18
L		
Laboratory, definition of ...	5	7
Laboratory, safety procedure ...	31	139-151
Ladders, issue of ...	27	121
Ladders, use of ...	9	30
Lamps, electric, replacing of ...	8	23
Leading Workers, duties of ...	—	12, 16, 20, 27, 38, 39, 41, 68, 90, 159 (c)
Lead (salvage) ...	22	92
Leather (contaminated), salvage	19	81
Leaving the station ...	6	10
Life Belts ...	31	138
Lifting tackle, issue and return of	27	121-124
Lifting tackle, inspection of ...	27	121
Limits, danger buildings ...	14	57
Limits, amendment of ...	40	Appendix G
Loading of trucks ...	12	52
Locking of buildings not in use ...	7	20
Locomotives, movement of ...	13	53
M		
Machinery in motion (cleaning of)	8	29
Machinery out of order to be reported ...	8	21
Man Limit (danger buildings) ...	14	57
Matches, prohibited ...	6	11
Means of ignition, authorised only to be used ...	7	15
Medicines, prohibited ...	6	11
Metal containers, for oil, etc., waste ...	8	25
Minor and running repairs in danger buildings ...	17	74-78

	<i>Page No.</i>	<i>Rule No.</i>
N		
New explosives plant (inspection) ...	14	56
Nitrous fumes and toxic gases ...	10, 30	36, 132, 134
Noise, undue to be avoided ...	7	17
Notification of Fire Brigade ...	33	152-158
O		
Opening danger buildings for work ...	10	38
Operating Instructions (Danger Buildings) ...	14	57-62
Orders to be obeyed ...	7	16
Own work to be kept to ...	8	22
P		
Packages in open trucks ...	12	52
Passage ways not to be obstructed ...	7	19
Pipe lines, disconnecting ...	9	33
Pipe lines, colour code ...	42	Appendix I
Planks not to be placed across uncovered vessels ...	9	32
Plant, repairs of ...	15-19	63-90
Plant removed from danger buildings ...	18	79
Plant clearance certificate ...	37	Appendix D
Points (Railway) ...	13	54
Police authorised to search ...	6	12
Portable electrical equipment ...	28	128
Procedure before repairs, alterations, etc., in danger buildings ...	15	63-65
Procedure during repairs, etc., in danger buildings ...	16	66-68
Procedure after repairs, etc., in danger buildings ...	16	69-73
Prohibited articles, list of ...	6	11
Proof Stands, definition of ...	5	9
R		
Reading of Rules ...	4	2, 3
Removal of all explosives before repair not required ...	17	74-75
Removal of floorboards, hand-rails, etc. ...	9	35

	<i>Page No.</i>	<i>Rule No.</i>
Removal of waste explosives ...	26	107-112
Removal of waste (service) ...	8	24
Repairs, alterations, etc., in danger buildings ...	15	63-75
Repair work (non explosives) ...	20	85-90
Repair work on explosives plant	19	80
Replacing electric lamps ...	8	23
Reporting of Rule Reading ...	4	2
Reporting of grievances ...	7	16
Respirators ...	30	131
Roll call after accident ...	34	159 (e)
Ropes, use of ...	9, 28	30, 124
Rule book, keeping of ...	4	1
Rule reading, certificate ...	36	Appendix B
Rules, disciplinary action for infringement ...	4	4
Rules, reading of ...	4	2-3
Rules, transport of explosives ...	51, 98	12, 24
Running or minor repairs in danger buildings ...	17	74-75
S		
Safety baths ...	31	136 (a)
Safety Regulations ...	14	
Salvage ...	22	91-94
Salvage equipment ...	30	133
Scaffolding, erection and use of ...	9	31
Searching ...	6	12
Security of buildings ...	7	20
Smoking, prohibited ...	6	13
Special Rules (Danger Buildings)	14	57-62
Spilling of explosives ...	11	45
Spilling of acids and dangerous liquids ...	9	34
Solvents, storage and use of ...	25	100-106
Sponge cloths, use of ...	8	25
Stationary trucks ...	13	55
Steam boilers ...	27	116
Steam engines ...	12	48
Steam receivers and containers ...	27	117
Steam pipes ...	12	46
Sticks and Umbrellas ...	10	40
Storage of Explosive and ammunition ...	23	95-97
Sunlight, explosives not to be exposed to ...	11	43

	Page No.	Rule No.
T		
Tackle Store (Issues from) ...	27	121-124
Taking of buildings and plant into use ...	14	56
Telephones, use during thunder-storm... ..	12	50
Temporary Special Rules, Use Lists	15	58
Thunderstorms, action during ...	12	50
Timber (contaminated salvage)'	19	81
Tobacco, prohibited	6	11
Tools in danger buildings ...	10	42
Tools, care of and examination ...	29	129
Toxic fumes	10	36
Traffic rules	12	51-55
Transport of explosives	24	98-99
Treatment of persons affected by fume	10, 30	36, 134
Truckers, duties of	12	51-55
Trucks, cleaning of	11	44
Trucks, movement of	13	53
Trucks, explosives	12	51
Trucks, stationary	13	55
U		
Unauthorised experiments ...	11	42
Undue noise	7	17
Unnecessary articles, accumula-tion of	8	24
Unsafe conditions, notice of ...	9	35
Unusual appearance of materials, plant, etc.	8	21
Unusual occurrences to be re-ported	8	21
Upsetting or spilling of explo-sives	11	45
Use Lists	14	57 (d)
Use Lists (amendment of) ...	40	Appendix G
Use of goggles and eyeshades ...	10, 31	37, 135
V		
Valves, disconnecting	9	33
Vessels containing dangerous substances	9	32

	Page No.	Rule No.
W		
Waste (explosives)'	26	107-112
Waste solvents	26	107-112
Waste solvents, laboratories ...	32	146
Welding in explosives buildings	19	81-84
Working at heights	9	31



high right
No.....



MINISTRY OF SUPPLY

SAFETY
RULES
OF THE
EXPLOSIVES RESEARCH
AND
DEVELOPMENT ESTABLISHMENT
WALTHAM ABBEY, ESSEX

1954

CONTENTS

	PAGE
INTRODUCTION	3
ADMINISTRATION OF THE RULES AND REGULATIONS ...	4
DEFINITIONS	5
GENERAL RULES	6
DANGER BUILDING RULES	10
TRAFFIC RULES	13
SAFETY REGULATIONS	14
AUTHORISATION OF BUILDINGS AND PLANT FOR EX- PLOSIONS USE	14
SPECIAL RULES, OPERATING INSTRUCTIONS, LIMITS ...	14
CLEARANCE PROCEDURE IN DANGER BUILDINGS AND PROOF STANDS	15
EMERGENCY OR MINOR REPAIRS (EXPLOSIVES PLANT) ...	17
CLEARANCE PROCEDURE FOR EXPLOSIVES PLANT FOR REMOVAL	18
BURNING, WELDING AND FLAMING OF PLANT AND EQUIPMENT	19
REPAIR OF PLANT WHERE DANGEROUS GASES OR FUMES MAY BE PRESENT	20
REPAIR OR MAINTENANCE TO NON-EXPLOSIVES PLANT, ETC.	21
SALVAGE	22
STORAGE OF EXPLOSIVES, AMMUNITION, ETC. ...	22
TRANSPORT OF EXPLOSIVES	24
BULK STORAGE AND USE OF SOLVENTS	25
DISPOSAL OF WASTE EXPLOSIVES, SOLVENTS, ETC. ...	26
REGISTERS REQUIRED UNDER THE FACTORIES ACT ...	26
ISSUE OF LIFTING TACKLE AND LADDERS	27
FENCING AND GUARDING OF MACHINERY, PITS AND VESSELS	28
USE OF PORTABLE ELECTRICAL ENGINEERING EQUIP- MENT	28

	PAGE
TOOLS, CARE OF	29
CYLINDERS AND DRUMS OF LIQUEFIED OR COMPRESSED GASES	29
SAFETY APPLIANCES	30
SAFETY PRECAUTIONS FOR LABORATORIES	31
PROCEDURE IN CASE OF FIRE DURING WORKING HOURS	33
ACTION IN CASE OF SERIOUS ACCIDENTS	34
DANGER BUILDING CLEARANCE CERTIFICATE (APPENDIX A)	35
RULE READING CERTIFICATE (APPENDIX B)	36
REPAIR OR DISPOSAL CERTIFICATE (APPENDIX C)	36
REPAIR OF PLANT CLEARANCE CERTIFICATE (APPENDIX D)	37
CHEMICAL WORKS CLEARANCE CERTIFICATE (APPENDIX E)	38
APPLICATION FOR PERMANENT OR TEMPORARY FIRE (APPENDIX F)	39
APPLICATION FOR ALTERATION OF EXPLOSIVES/MAN LIMITS, ETC. (APPENDIX G)	40
IDENTIFICATION COLOUR CODE FOR GAS CYLINDER (APPENDIX H)	41
COLOUR CODE FOR PIPING (APPENDIX I)	42
LOCKER MAGAZINES (APPENDIX J)	43
INDEX... ..	44

Introduction

IN an establishment mainly devoted to Explosives work, the hazards are by nature greater than elsewhere.

These rules have been drawn up for observance by all personnel employed at the Explosives Research and Development Establishment at Waltham Abbey in order to ensure orderly conduct and the prevention of accidents.

The rules of conduct are to be read in conjunction with the M.O.S. Staff Regulations, and subsequent amendments and Departmental Instructions.

Work at this station conforms to the requirements of The Explosives Act, 1875 and 1923, The Factories Act, 1937, and all statutory rules and orders issued in connection with these Acts, except buildings specially designated by the Chief Superintendent as laboratories.

Administration of the Rules and Regulations

1. All persons employed in the Station will be provided with a copy of these rules. This copy is to be kept in good order, produced when required, and surrendered on termination of service.

2. Portions of the rules and amendments selected by the Safety Officer are to be read monthly to all persons by the foreman responsible for their supervision. A certificate (Appendix B), will be passed by the foreman to the Safety Officer after each reading.

3. Special Rules and Operating Instructions (see para. 57), as posted in the various Danger Buildings, Proof Stands and Burning Grounds, are to be read weekly to the operators concerned by the person nominated by the scientist in charge of the group. A record of such readings will be kept by the scientist in charge.

4. Any infringement of the rules will render the offender liable to disciplinary action, which may involve suspension or discharge.

Definitions

5. The name "Danger Building" means any magazine, building or part thereof in which finished explosives, explosives or their ingredients in any stage of explosives manufacture, or explosives packages, are handled. The name also includes trucks and other means for conveyance used in connection with such manufacture or handling.

6. "Danger Building" as applied to buildings, platforms, trucks, clothing, etc., means that they are so constructed, arranged and maintained as to ensure absence of grit, dust or other extraneous matter and are only to be used for, or in connection with, explosives.

7. The name "Laboratory" applies to all buildings so designated by the Chief Superintendent in writing. These buildings are not subject to The Factories Act, 1937, or The Explosives Act, 1875.

8. The name "Proof Stand" applies to all buildings so designated by the Chief Superintendent in writing, and are subject to The Factories Act, 1937, and/or The Explosives Act, 1875.

General Rules

9. **Entering or leaving station.**—No person is to enter or leave the establishment except by the authorised gates, unless so authorised. No person under the rank of A.E.O. is to leave at any but his authorised time without a pass signed by the appropriate higher authority.

10. **Prohibited articles.**—All persons are forbidden to bring into the station, except by special permission of the Chief Superintendent, or his deputy, any of the following articles :—
Chemicals.
Dangerous articles such as firearms, explosives.
Cameras.

All persons are forbidden to bring into contraband areas without permission, any of the following articles :—
Tobacco pipes and smoking implements of all kinds.
Matches and any means of striking or procuring a light or fire.
Medicines or drugs.

All persons must ensure that they are free of any such articles before entering the area, and if not must deposit them in the contraband boxes provided at the entrances to the area.

11. No person in Danger Building Clothing is to be in possession of any personal articles except money (in the bag provided), a handkerchief, and plain rings without stones which are too tight to be removed.

It must be clearly understood that other personal articles are to be deposited in the shifting rooms at the owner's risk.

Any person finding himself when inside the station to be in possession of forbidden articles is at once to deliver them to the nearest official who will advise the police to collect.

12. **Searching.**—On entering or leaving the station all persons are to submit themselves or any bag, basket or parcel to be searched if so required by the police.

All persons, including service workmen employed in danger buildings, are to be searched before commencing work by the senior worker present.

13. **Smoking.**—No smoking is allowed in the Station except in places specially authorised by the Chief Superintendent.

14. **Food.**—All persons bringing in food must deposit it at the canteen before proceeding to work. Food is not to be taken into any other building except where authorised.

15. Fires.—

- (a) *General.* No fires or naked lights are to be used in the station except in places or by persons duly authorised. Internal combustion or C.I., engines, electric drills, or steam engines, portable electric lamps, flint or electric lighters are for the purpose of the rules, fires.
- (b) *Permanent fires.* Standing authority will be granted in respect of approved permanent fires or lights on application to the Safety Officer.
- (c) *Temporary fires.* Application for temporary fires or lights must be made through the scientist in charge of the group in duplicate on the approved form (Appendix F) to the Safety Officer, who will specify any precaution necessary. One copy will be passed to the Fire Brigade Officer and the other retained by the worker responsible for the fire and afterwards returned, duly signed, to the Safety Officer.

Plant requiring burning or flaming is, in addition, subject to special precautions and dealt with in the Safety Regulations (page 14).

16. **Obedience to orders.**—All workers are to obey the orders of the foremen, senior workers, etc.

Should any grievance be felt against any order, representation may subsequently be made to higher authority.

No person is to pass any board, flag or notice forbidding entry without permission of the person in charge.

17. **Conduct.**—All persons are to check in themselves or others, any tendency towards skylarking or carelessness. There is to be no loitering or irresponsible conduct.

Undue noise is to be avoided.

18. **Keys.**—Keys of all buildings except laboratories will be under the custody of the foreman or officer in charge.

Keys, which will be three in number, for laboratories will be held by the scientist in charge or his deputy, and duplicates by the police for issue to authorised persons.

Keys are to be issued by the police only to persons authorised to receive them.

19. **Exits of buildings.**—Doors of buildings in use are to be kept unlocked and unbolted, and doors and passage-ways are to be kept free from obstruction.

20. **Security of buildings.**—When not in use buildings are to be kept locked. Leading workers are to see that windows and shutters are fastened and bolted, all lights extinguished, isolator switches switched off, and all outer doors locked on leaving their buildings.

21. **Anything unusual to be reported.**—All persons are immediately to report to higher authority anything unusual or apparently dangerous which they may observe.

22. **Workmen to keep to their own work.**—No person is to interfere with anything in the Station, such as lines and points, buildings and their fittings, plant, machinery, tools, etc., except in the fulfilment of his duty.

23. **Electrical and gas fittings.**—No unauthorised person is to interfere with the electrical or gas installations or fittings.

Permanent electrical equipment is to be inspected by the Electrical Section at intervals as laid down by the Chief Engineer.

24. **Factory cleanliness.**—Plant, buildings and the Station generally are to be maintained in a clean condition and free from accumulations of rubbish and waste. Service departments are responsible for removing their waste upon completion of their work.

25. **Sponge cloths and cotton waste.**—Sponge cloths and cotton waste which have been used with oils and turpentine are not to be taken into any building in the Station except for immediate use. After such use they are to be removed immediately to the metal containers provided solely for that purpose outside the building.

26. **Economy in the use of material.**—Strict economy is to be observed in the use of materials and service supplies. Arrangements made for salvaging are to be observed.

27. **Fire fighting equipment.**—The leading worker in each building is to arrange :—

- (a) To keep hoses, fire extinguishers, buckets, etc., ready for use and in the position assigned to them.
- (b) To keep drowning tanks filled as directed.
- (c) To ensure that fire-fighting equipment is not used for any but fire-fighting purposes.

It is the responsibility of the scientist in charge to ensure that the necessary equipment is available, or to obtain it from the fire brigade.

28. **First Aid equipment.**—Foremen will be responsible for ensuring that First Aid boxes in their area are kept in good order and supplies replenished.

First Aid boxes in laboratories will be in charge of the appointed First Aid assistant for the laboratory.

29. **Driving belts and machinery in motion.**—Driving belts are not to be put on or taken off pulleys, nor is overhead shafting to be lubricated or adjusted, by any but authorised persons.

All belts on machines when in motion are to be covered by a guard.

Machines are not to be cleaned when in motion.

Belts are not to be left resting on revolving shafting.

Ladders are not to be placed or left in positions giving access to unguarded shafting in, or liable to be set in, motion.

Fencing and machinery guards provided for safety purposes must be fixed except when a machine is being repaired or adjusted and is not in motion.

30. **Ladders and ropes.**—Ladders, when in use, are to be held by another person or secured at the top. Boys are not to hold ladders.

Ladders and ropes are not to be used in pools or sumps unless the nature and location of the work demands it; they are to be kept away from acids and other liquids likely to attack and rot the material.

Improvised or defective ladders are not to be used.

Ladders employed for access to tanks are to project approximately 3 feet above man-holes or the sides of the tanks.

31. **Scaffolding.**—Where it is necessary to erect scaffolding for repairs or maintenance work, it is to be constructed with due regard for normally accepted safety precautions.

No person is to use scaffolding at heights above 10 ft. from the ground or floor unless adequate hand-rails and toe-boards are provided.

32. **Vessels containing dangerous substances.**—No plank, gangway or covering other than that designed and fitted for the purpose, is to be placed across any uncovered vessel containing acid, hot water or any other dangerous substance.

No person is to walk on the covers of any covered vessel containing acid, hot water or any other dangerous substance. Only the gangways and planks designed for the purpose are to be used for crossing such vessels.

33. **Disconnecting pipe lines.**—No pipe line or valve liable to contain a dangerous substance is to be disconnected or repaired *in situ* until a clearance certificate has been obtained.

34. **Spillage of acids or dangerous liquids.**—In the event of the accidental spillage or leakage of acid or dangerous liquid, immediate notification is to be made to the foreman or higher authority who will take the necessary steps to minimise danger.

35. Cleaning, repair or decontamination work.—Where cleaning or repair work involves unsafe conditions a cautionary notice is to be displayed.

Any person removing floor boards, gratings, hand-rails or other protective appliances for any purpose, is to replace them immediately the work is completed, or temporarily suspended; otherwise an equally safe alternative is to be provided.

36. Toxic Gases.—No person is to enter any tank or place where there is reason to suspect danger from toxic gases until a clearance certificate has been issued.

Any person who feels the effect of dangerous fumes is immediately to report to the leading worker present, who will arrange for his removal to the surgery in the manner prescribed in Rule 134.

37. Use of goggles or eyeshields.—Persons employed on grinding, welding or on operations giving rise to flying fragments or abrasive dust or on processes involving risk of personal injury from splashes of dangerous liquids are to wear the goggles or eyeshields provided.

Persons employed in handling acids or corrosive chemicals must handle these substances with care, and avoid spillages and splashes. They must wear the protective clothing and equipment provided.

Danger Building Rules

38. Opening danger buildings for work.—Before commencing work in any danger building all doors are to be unlocked and unbolted. Keys and locking bars are to be removed and hung up on the hooks provided, and bolts withdrawn and placed in the loops or secured by means of the pins provided. Leading workers are responsible that this is done.

Doors, when unlocked, are to remain closed or are to be fastened back. Danger buildings are not to be left unattended unless locked.

39. Footwear.—All workmen entering danger buildings are to put on the special footwear authorised before crossing the entrance barrier, leaving their own footwear outside the barrier. A reverse procedure is to be observed when leaving the building.

Danger building footwear is not to be deposited in any place where it can come in contact with dirt, grit or acid. It is to be examined by the leading worker before being put on at the commencement of the shift.

The special footwear provided (overboots, goshes, etc.) for the use of officials is not to be worn by any person below the rank of assistant foreman. Before using the footwear all persons are to remove where possible any dirt from the trouser turn-up.

40. Sticks and umbrellas.—Sticks and umbrellas are not to be taken into danger buildings.

41. Danger building limits.—The leading worker of each danger building is responsible that the number of persons and the quantities of explosives do not exceed the limits posted up in the danger buildings.

No unauthorised person is to approach or carry out work of any nature in the danger building area.

42. Care in work.—All work in danger buildings is to be carried out in accordance with the Special Rules and Operating Instructions applicable to the process.

Persons employed in danger buildings are to carry on their work as carefully as possible. Should any operation appear to require the employment of unusual force it is to be suspended at once and the matter referred to higher authority.

Tools and implements are to be used with the greatest care and movements involving blows or friction are to be avoided. Articles are not to be thrown down or allowed to fall or drop on to the floor.

No person is to carry out experiments in danger buildings or with explosives without the authority of the Chief Superintendent.

Pieces of chalk, pencils and similar articles are not to be placed behind the ear. Such articles must be kept in the places provided when not in use.

43. Handling of explosives and explosives receptacles.—Explosives and their receptacles are not to be exposed to direct sunlight.

Receptacles and packages of all kinds for explosives, whether full or empty, are not to be roughly handled or dropped. They are to be lifted clear from place to place, and are not to be dragged along, pushed, put down carelessly or slid except on conveyors.

Receptacles are to be examined for cleanliness and freedom from foreign substances before explosives are put into them. Should any foreign substance be found in any receptacle containing explosives both are to be put on one side and the matter referred immediately to the leading worker or higher authority.

Bags are to be turned inside out for examination.

All explosives are to be kept covered except when work is being carried out on them or where the nature of the process precludes this.

Bags containing explosives are to be securely tied and boxes securely fastened before conveyance by truck.

44. **Cleanliness.**—The danger building platforms, floors and interiors of danger buildings, trucks, plant and machines are to be kept free from dirt, grit, and unnecessary accumulations of materials. In buildings where floors are kept dry, any water accidentally spilled on to the floor is to be mopped up immediately.

45. **Upsetting or spilling of explosives.**—In the event of the accidental upsetting or spilling of explosives on tram lines, platforms or other places outside danger buildings, the leading worker or higher authority is to be informed at once. No attempt is to be made to move the truck or to clear up the explosives until the assistant foreman or higher authority arrives to superintend. Approaching traffic is to be stopped until the site has been cleared.

46. **Steam pipes.**—Explosives are not to be placed within 2 feet, and wood or other inflammable substances within 6 inches, of steam pipes, boilers or ovens except when authorised by the scientist in charge.

All steam pipes shall be lagged where they are in such a position to provide easy contact for personnel.

47. **Aluminium paint.**—Aluminium paint is not to be used in danger buildings.

48. **Internal combustion, C.I. or steam engines.**—Apparatus operated by internal combustion or C.I. engines is not to be used within 30 yards of any building containing explosives, except by written permission of the Chief Superintendent.

On the approach of trucks containing explosives the engine is to be stopped.

Steam engines are not to approach within 75 yards of any building containing explosives, except by written permission of the Chief Superintendent.

49. **Grass cutting.**—Grass in the vicinity of danger buildings is to be cut at frequent intervals, and after cutting is to be removed as soon as possible. If, for any reason, cutting should not be possible, or if after cutting it should not be possible to remove the grass, during dry weather it is to be kept wet in the vicinity of the danger building.

50. **Thunderstorms.**—On the approach of a thunderstorm, the foreman will close down any danger building in accordance

with the Special Rules for that building. The buildings vacated are to be secured until the storm has passed over. Danger building telephones are not to be used during a thunderstorm.

Traffic Rules

51. **Explosives trucks.**—Explosives trucks are only to be used for conveyance of explosives. They must be kept clean and examined before use.

Doors or loose flaps of explosives trucks are to be closed and fastened except when loading or unloading.

Trucks containing explosives are not to be left unattended except at the places approved for this purpose.

Bags containing explosives must be tied before putting them into trucks and must be so placed that the mouths are not facing outwards.

52. **Packages in open trucks.**—Cases, barrels, drums, cylinders, boxes or bags are not to project beyond or above the sides or ends of the trucks. Loads are to be adequately secured.

53. **Movement of tractors and trucks.**—Persons moving trucks by hand are to maintain a walking pace and are not to relinquish their hold of trucks in motion.

No person is to sit or ride on trucks or tractors except by permission of the assistant foreman or higher authority.

Rail trucks are not to be pulled or drawn by hand from the front except where it is necessary to pull them clear of the porches of buildings, etc.

All trucks are to give way to trucks loaded with explosives.

Empty trucks are to give way to loaded ones. Narrow gauge trucks are not to be lifted off the lines to allow others to pass.

Before taking trucks inside a traverse or porch of a danger building the trucker is to ascertain whether he may enter.

Rail tractors and trucks are to be kept to the left-hand tracks, and road trucks to the left-hand side of the road.

54. **Points.**—Persons in charge of trucks and tractors are to see that the trucks and/or tractors are clear of the points before the points are moved, and that they are not left standing over any points, or in any other position where they are liable to be fouled by other traffic.

Branch line points are to be altered after use to provide a clear course for traffic on the main lines.

55. **Stationary trucks.**—Trucks are not to be left standing on main lines.

Trucks are not to be left standing unless the brake is fully applied, or other steps taken to prevent movement.

Safety Regulations

AUTHORISATION OF BUILDINGS AND PLANT FOR EXPLOSIVES USE

56. (a) In the event of a building being required for use, notification for the purpose of inspection is to be made to the Safety Officer. The intended use of the building, the name of the explosive and the amount, are to be supplied.
- (b) The Safety Officer will then inspect the building, and advise on its use for the purpose stated, or submit recommendations for its improvement.
- (c) The appropriate Superintendent will give final approval for the building to be used as required.
- (d) A building must not be taken into use for a purpose different from its previous use without approval of the appropriate Superintendent being first obtained.
- (e) All plant and equipment intended for use in connection with explosives must be examined by the Safety Officer before being taken into use.
- (f) A clearance certificate must be obtained by the scientist in charge from the Safety Officer, in respect of each building which he vacates.

SPECIAL RULES, OPERATING INSTRUCTIONS, USE LISTS, EXPLOSIVES AND MAN LIMITS

57. In every danger building or proof stand there must be exhibited on a board :—
- (a) The limit by dry weight of explosive or ingredients allowed.
- (b) The Man Limit (this does not include scientific staff or visitors, but in the event of the leading worker considering that the work is in danger of being obstructed he may request some of the visitors to wait until the building is clear).
- (c) Special Rules for the safe conduct of the operation. These rules may be temporary in the event of the process being carried out under the control of a scientific officer. Permanent rules are to be prepared as soon as the process passes out of such control and are then to be submitted by the Head of Section for authorisation by the Superintendent concerned, through the Safety Officer.
- (d) Operating Instructions giving details of the method of carrying out the process,

- (e) Use List giving the items of movable equipment permitted in the building in connection with the process.
58. If the process is in a trial stage, the Operating Instructions and Use List may be entered in a Log Book, but as soon as possible the Instructions and the Use List are to be exhibited on the board.
59. A Log Book (as mentioned in Rule 58) is to be maintained in every danger building and proof stand. Recordings, instructions, and temporary tools as required by the scientist in charge are to be noted therein.
60. (a) Alterations or additions to Special Rules and Limits as required are to be submitted on the appropriate form (Appendix G), stating if temporary or permanent, to the Superintendent concerned through the Safety Officer.
- (b) Such alterations or additions will be passed by the Safety Officer to the Superintendent, either on a temporary card which after authorisation will be exhibited in the house concerned, or if permanent will be authorised on a typed slip and then posted to delete the obsolete limit or rule and added to the existing rules.
61. Copies of the Special Rules, etc., will be kept by the Safety Officer and Head of Section, who will be responsible for seeing that all amendments are duly posted in their copies.
62. Special Rules, etc., are to be kept in a legible condition.

CLEARANCE PROCEDURE IN DANGER BUILDINGS AND PROOF STANDS

63. (a) Before any repairs (other than repairs provided for under emergency or minor repairs) are carried out in any part of a building, that part and the plant in it must be cleaned of all explosives as far as possible, and so certified on the appropriate certificate (Appendix A) which is to be kept in the building during repair.
- (b) The Safety Visitor will certify that, in addition to the plant being clear of explosives, it is also isolated from all sources of gas, acid, or inflammable materials, and that all sources of motive power are cut off either by removal of fuses, locking of switchgear or removal of belts, and that where applicable a notice "Do not start" is exhibited on the starting gear.

64. (a) In the case where certain plant requires partial dismantling before thorough cleaning can be carried out, such operations are listed in the Special Rules of the house. The plant must be washed through before dismantling takes place, and the exterior must also be clear of all explosives. No metal tool is to be applied to any piece of plant contaminated with explosives. All bolts should be sprayed with a penetrating oil before removal.
- (b) While such dismantling is in operation, a process worker must stand by to remove any explosive which may be exposed, and all other work must stop until the explosive is removed. A tradesman is not permitted to remove explosive.
65. If a Safety Visitor is not fully satisfied regarding a particular part of the plant, such as a valve or pipe, etc., being clean, this fact is to be noted on the reverse of the clearance certificate, and care exercised during the dismantling.
66. (a) All fitters are to be provided with a box for storing small parts of plant removed. These must not be allowed to lie about.
- (b) Wherever possible safety tools are to be used.
67. Precautions must be taken to avoid damaging the floor. Waste gulleys are to be blocked to prevent the passing of grit, etc., into savealls.
68. Any plant found to be in any way contaminated is to be removed from the building and cleaned away from the scene of the repair in an approved place. Tools used for repair work must be passed as clean before removal from the building by the leading process worker.
69. The Safety Visitor is responsible for ensuring that the plant and building are thoroughly cleaned, and free from foreign material, and will complete the certificate to this effect. The scientist in charge will then satisfy himself that everything is in order before issuing instructions that the process work is to proceed.
70. (a) Any plant, pipes, motors, etc., which are to be removed for repair or salvage must first be certified as free from explosive or inflammable material by the scientist in charge, and a certificate (Appendix C) attached to the plant before removal. It is forbidden to work on any such plant unless the certificate is attached.

- (b) If the scientist in charge is not fully satisfied regarding the clearance of such plant, he is to give detailed instructions for repairs, or if for salvage the plant must be passed to the burning ground for burning and then recertified by the scientist in charge. More than one burning may be necessary.
71. No plant is to be stored for possible future use until it is certified clean.
- Such plant will be marked in distinctive paint as follows :—
 One dot denotes rough cleaning.
 Two dots denotes thorough washing.
 Three dots denotes flame or fire treatment.
72. Second-hand pipework must not be cut by sawing, but roller cutters used, and before complete penetration is obtained the pipe is to be broken.
73. All lead after certification is not to be re-used but passed back to the chemical plumbers for melting under approved conditions.

EMERGENCY OR MINOR REPAIRS (EXPLOSIVES PLANT)

74. Where repairs or adjustments are necessary to enable normal manufacture to proceed, emergency or minor repairs may be carried out under the personal supervision of the scientist in charge or responsible person appointed by him.
75. (a) Where possible all explosives must be removed before commencing work. Plant must be thoroughly cleaned down, especially where it is necessary to use spanners or grips. All nuts should be sprayed with penetrating oil.
- (b) Surrounding plant must be screened and if work is overhead, covering sheets placed underneath.
- (c) The area should be marked off to prevent intrusion but not to hinder a quick exit.
- (d) Waste gulleys should be blocked to prevent foreign matter entering savealls.
- (e) No metal tool is to be applied to any part which is contaminated with explosives.
- (f) A process worker is to stand by ready with a water hose or steam to remove any explosive exposed. A tradesman is not allowed to remove explosive from the plant. Any dirt or grit should be cleaned up as made.
- (g) Any explosive exposed or removed must be taken away immediately and placed in a waste receptacle outside the building.

(h) The process worker must see that all small parts as removed are free from explosives and, if so, placed in a box. Any contaminated part is to be removed and cleaned away from the area of repair or alteration. No repair work is to be carried out on any part contaminated with explosives until cleaned.

76. (a) If the work undertaken is in connection with acid or if there is reason to apprehend the presence of dangerous fumes, a gas mask or breathing apparatus must be held ready.

(b) Further precautions may be considered necessary, and in every case the Safety Officer or Safety Visitor is to be advised and will arrange inspection to see that these precautions are being adopted and the scientist's instructions complied with.

77. Normal instructions regarding the isolation of acid, gas and power must in all cases be carried out. (Chem. Works Reg. No. 7.)

78. The plant must be thoroughly washed or cleaned down after repair.

CLEARANCE PROCEDURE FOR EXPLOSIVES PLANT FOR REMOVAL FROM EXPLOSIVES BUILDINGS

79. Plant may be removed from a building for repair, scrap or salvage subject to the following precautions :—

(a) Plant for removal to a cleansing centre is to be cleaned to remove any explosives which may be dislodged during transit. Pipes and ducts should be blocked at the ends, and the lids secured during transit.

(b) Where no cleansing centre is installed then the plant must be thoroughly cleaned in the building. It should not be cleaned on a wooden platform or floor unless this is protected by a covering, *e.g.*, metal sheet or tray.

(c) If solvents are used in the cleaning, care must be taken to ensure that the building is well ventilated, and that solvent is not spilled on the floor. The use of solvents for cleaning should be avoided as far as possible owing to their toxicity and/or inflammability. During their use, explosives precautions must be observed, and thereafter no naked flame be permitted in the building until the atmosphere is free from dangerous vapour concentration.

(d) Before the plant is removed either from the cleansing centre, or building, it must be certified free from explosives by the scientist in charge who will sign the certificate (Appendix C), and securely attach it to the plant. Each item of plant must be labelled separately. Plant must be removed promptly from a building after certification.

(e) If the scientist in charge, or authorised deputy not below the rank of E.O., is not fully satisfied and requires the plant to be subjected to flame treatment, he is responsible for supervising such treatment or ensuring the plant is passed to the burning ground, and finally is to certify the plant clear and attach the certificate.

80. Tradesmen must not work on any plant unless it carries a clearance certificate. In the event of the certificate becoming mislaid, application must be made by the foreman tradesman to the scientist in charge for a new certificate, and work suspended until this is forthcoming.

BURNING, WELDING OR FLAMING OF PLANT AND EQUIPMENT

81. Contaminated equipment of leather, timber, canvas, etc., is not to be salvaged but destroyed by burning.

82. Only metal plant and equipment passed by the Engineering Department for salvage is to be passed through the fire.

83. Metal plant and equipment for re-use must be cleared of explosives by flaming operations at the cleansing centre, after removal of all explosives as far as possible by normal cleaning methods.

84. (a) Where it is not possible to remove plant or equipment, this must be certified to be as free as possible from explosive, and suitable precautions adopted as detailed by the Safety Officer on Form (Appendix F).

(b) Preliminary flame testing is to be carried out in the presence of a Safety Visitor before the flame is used in the normal manner.

(c) Where any solvent, inflammable or otherwise, has been used in or for cleaning plant or equipment to be welded, it is essential that this is noted on the application for a Fire Pass, and the scientific officer in charge must ensure that the plant is thoroughly steamed, filled with water where possible and then emptied before any flame is applied.

- (d) A process worker must be in attendance with a running hose during the operation, and wherever possible the floor and walls must be thoroughly wetted.

REPAIR OF PLANT (OTHER THAN EXPLOSIVE) WHERE DANGEROUS GAS OR FUME MAY BE PRESENT

(Chemical Works Reg. No. 7.)

85. Chemical Works Regulation No. 7 states that where any person, other than for rescue purposes, enters any tank, tower, or any other place where there is reason to apprehend the presence of dangerous gas or fume, a certificate must be completed stating either :—

- (a) That the place has been examined personally by a responsible person who certifies in writing in a book kept for the purpose that such place is isolated and sealed from all source of gas or fume and is free from danger ; or
- (b) That it is not so isolated and free from danger and no person shall enter unless he is wearing a breathing apparatus and a life belt (provided there are no cross stays or obstructions likely to cause entanglement), the free end of which shall be attached to a rope left with a man outside, whose *sole* duty is to keep watch and arrange to draw the wearer out immediately if he appears to be affected by gas or fume.

In practice the word "place" is given a wide interpretation to include such places as an acid pump house, storage tank (open type).

A responsible person is the Head of Section or authorised deputy not below the rank of Experimental Officer.

86. (a) Whenever possible an enclosed vessel or place must be isolated and sealed from every source of gas, fume, or motive power, and made free from danger before anyone is allowed to enter.
- (b) Analysis for toxic gases applicable must be made in the vessel or place not more than one hour before anyone is allowed to enter. If there is reason to suspect the presence of inflammable gas from solvents or leakage, tests must be made and appropriate action taken.
- (c) Chemical Works Regulation Certificate (Appendix E) must be completely filled in and signed by the certifying scientist when his examination has been made.
- (d) The certifying scientist must enter and examine the vessel within 10 minutes of work being commenced in the vessel.

- (e) The procedure stated in Rule 86 (a), (b), (c) and (d), must be re-confirmed and carried out at the beginning of each shift whilst work is being done and whenever work recommences after an interval sufficiently long as to make the composition of the atmosphere in the vessel uncertain.
- (f) Work must immediately cease and a re-inspection made if any complaint is made by the workman.
- (g) Any person entering the vessel must wear a safety belt to which a rope is securely, attached the free end being held by a person outside, and where possible an escape ladder is to be provided.
- (h) Where possible a continuous fresh air supply is to be blown into the vessel or place.
- (i) Breathing apparatus is to be immediately available in the close vicinity.

87. Where there is a possibility of Arseniuretted Hydrogen being evolved during the cleaning out of any plant, *e.g.*, those used for sulphuric or hydrochloric acid, non-metallic scrapers and pails must be used (Chemical Works Reg. 9).

REPAIR OR MAINTENANCE TO NON-EXPLOSIVES PLANT OR TO PLANT NOT IN ANY PLACE WHERE THERE MAY BE DANGEROUS FUME OR GAS

88. The Section in normal control will arrange for the isolation of machinery from all sources of motive power either by removal of belts, removal of fuses or by locking of switch-gear, and will exhibit notices on the starting boxes, "Do not start."

89. If the work is on acid pipe lines, valves or other plant connected to sources of acid or other dangerous substances, the valves on each side are to be closed and locked if possible, and a notice "Do not start" placed on the valves. A hose pipe is to be kept running in the near vicinity.

90. (a) The Head of Section or his authorised deputy will then pass a certificate (Appendix D) to the Service Section, and state on the form if extra precautions will be required, *e.g.*, wearing of goggles, gloves, the possibility of acid being in the pipe lines, or the desirability of removing sections of pipes and fitting blank flanges.

- (b) The certificate will be held by the leading worker of the repair crew on the job until work is completed when he will sign the form and return it to the Section in normal control. No tradesman is to carry out repairs or maintenance on any plant or machinery unless a certificate is passed to the leading worker in charge of the job.
- (c) These certificates must be completed for each different job being done and whenever plant (except where the D.B. clearance certificate (Appendix A) operates) is handed from one group to another, *e.g.*, Engineering Dept. to Building Works Dept., or Plumbers to Electricians, etc.
- (d) The certificates must be re-confirmed by the submitting Section each day if work is in operation for more than one day.
- (e) These certificates will be retained in the Section Office for a period of 12 months before destroying.

SALVAGE

91. Plant or metal passed to the Engineering Department and agreed by them for salvage purpose must be certified as free from explosives, acid or dangerous liquid (Certificate, Appendix C). The Engineering Department will not accept plant unless it carries a certificate to this effect.

92. Lead work, after certification, will be passed to the chemical plumbers for melting under approved conditions.

93. Before any salvage plant or metal is allowed to leave the factory, a clearance certificate is to be obtained from the Safety Officer or Safety Visitor, and passed to the Stores before the Property Pass is completed.

94. Salvage dumps are the responsibility of the Engineering Department.

STORAGE OF EXPLOSIVES, AMMUNITION AND CHEMICAL WARFARE STORES

95. For the purpose of storage, explosives, ammunition and chemical warfare stores are grouped into 15 groups, and these groups should as far as possible be stored separately.

Where accommodation will not permit all groups to be stored separately, the following groups may be stored together as shown :—

- (a) Groups I, II and IV, under magazine conditions only.
- (b) Groups V, VI, VIII, X.
- (c) Group VII and safety cartridges from Group VI.
- (d) Groups IX and XI.
- (e) Groups III, XII, XIII and XV must always be stored in separate buildings.

Group 1. Explosives needing care in handling because they are liable to function by spark or friction, but which are not subject to deterioration with age. Liable, in a fire, to burn rapidly to violent explosion or detonation. All explosives requiring "lead-free" conditions are included in this Group.

Group 2. Explosives with risks similar to those of Group 1 but subject to deterioration with age. These explosives have usually an allotted "life" at the end of which they must be destroyed.

Group 3. Explosives of limited "life" but not liable to explode violently or detonate on catching fire. Cordite is the typical explosive of this group.

Group 4. As Group 1, but less sensitive.

Group 5. Unboxed shell.

Group 6. Boxed Service ammunition, containing high explosives, gunpowder and propellants only, except the types allotted to the following Groups.

Group 7. Mines, bombs, and underwater ammunition, filled H.E., plugged. With fuses, etc., in separate packages.

Group 7A. As for Group 7, but with fuses, etc., fitted.

Group 8. Mortar ammunition, grenades, and rockets containing H.E. and propellant only. Fuses, etc., in separate packages.

Group 9. Pyrotechnics.

Group 10. Detonators, initiating compositions.

Group 11. Incendiary and smoke compositions and ammunition. (Not containing white phosphorus, phosphides, inflammable liquids or gels.)

Group 12. Smoke and incendiaries containing white phosphorus or phosphides.

Group 13. Chemical Warfare ammunition.

Group 14. This is a Naval Storage Group.

Group 15. Incendiaries containing inflammable liquids or gels but not containing white phosphorus or phosphides.

96. Magazines will be under the supervision of the Safety Officer and reference should be made to him regarding storage.

97. Separate stores will be maintained for chemical laboratories where small quantities of explosives are required, and these stores will be under the supervision of the scientist in charge of the laboratory (see Appendix J).

TRANSPORT OF EXPLOSIVES

98. **Internal Transport.**—The internal transport of explosives is subject to the Traffic Rules and the Special Rules applying to trucks. These Special Rules will be detailed for each explosive and until so detailed no transport will be allowed. Special Rules will be drawn up by the Safety Officer and authorised by the Chief Superintendent.

99. External Transport (Road).—

- (a) Only the type of vehicle approved by the Safety Officer is to be used, and only explosives approved by him are to be carried.
- (b) The interior part of the vehicle for carrying the load is to be cleaned free from grit, oily rags, waste or other combustible material.
- (c) No vehicle is to carry more than 10,000 lbs. net of explosive. The limit in each case will be laid down by the Safety Officer.
- (d) Each package is to be marked in the following manner:
 - (i) Class of explosive.
 - (ii) Type of explosive.
 - (iii) Station monogram or address of consignor.
 - (iv) Address of consignee.
- (e) Wherever possible the load of each vehicle shall consist of explosives of one group only, except that to secure a full load, the load may consist of explosives of any or all groups excepting Groups I, XII and XIII.
- (f) All packages are to be well secured and are to be protected from weather, pilfering or sabotage.
- (g) The engine must be stopped during loading or unloading or whilst filling with fuel.
- (h) No smoking is allowed during loading or unloading.
- (i) The loading or unloading must be carried out without interruption. In wet weather packages of explosives are to be kept dry.
- (j) The driver is to be fully informed as to his conduct during the journey and the address and telephone number of the consignee.

- (k) No frozen explosive is to be handled without special instructions from the scientist in charge.
- (l) The person responsible for loading or unloading will ensure that the above rules are carried out.

BULK STORAGE AND USE OF SOLVENTS

100. (a) All solvents in bulk are to be kept in a store specially provided for the purpose.
- (b) Inflammable solvents are to be kept apart and the area of storage so labelled.
- (c) The opening of drums is to be carried out in the open air or with doors and windows open to prevent toxic and/or inflammable concentrations of vapour arising.
- (d) Inflammable solvents are to be opened only with the non-ferrous key provided. In event of this failing a wooden hammer may be used to assist unscrewing. Footwear free from iron or steel must be worn.
- (e) A detachable earthing clip should be attached at the Solvent Store to drums in use to prevent the building up of static charges during filling of smaller vessels.

101. Drums which have contained solvent must not be used for any other purpose until they have been certified as clear by the Head of Section, or authorised deputy not below the rank of E.O., or by the Safety Officer. Such drums must not be heated by application of a flame, etc., without the special authority of the Safety Officer.

102. Solvents are only allowed into danger buildings in accordance with the Special Rules. Solvents must be kept in a marked container approved by the Safety Officer.

103. The use of solvents for cleaning plant should be avoided as far as possible, and on no account is a naked light to be allowed in a building where an inflammable solvent has been used until the Head of Section or authorised deputy not below the rank of E.O., has certified that the building is clear of inflammable vapour.

104. Solvents must only be used in a well ventilated building.

105. Care must be taken to avoid the spillage of solvents, and trays should be provided for holding solvent containers.

106. Rags and waste contaminated with solvents must be removed from the building as soon as possible after use, and placed in the metal bins provided.

DISPOSAL OF WASTE EXPLOSIVES, SOLVENTS, ETC.

107. Waste explosives, solvents and empty glassware should be segregated into approved categories as directed by the Safety Officer and a separate container maintained for each category.

108. The disposal of waste explosives and solvents forms one of the Special Rules exhibited in each house.

109. The waste is to be conveyed in a closed container appropriately marked "WASTE and TYPE THEREOF" to the Central Waste collecting station for the area and then deposited in the container similarly marked.

110. The burning ground attendant will visit each central collecting station daily and collect waste, conveying this by truck, clearly marked "WASTE ONLY." This truck must only be used for the collection of waste.

111. The attendant is responsible for keeping the waste station clean, and for seeing that a supply of waste containers is always available.

112. The attendant will remove the waste to the burning ground, ensuring that rags, broken boxes, glassware, etc., are kept separate from explosives, and carry out the burning in accordance with the Special Instructions exhibited at the Burning Ground.

REGISTERS TO BE KEPT IN ACCORDANCE WITH THE REQUIREMENTS OF THE FACTORIES ACT (1937)

113. Chains, rope, lifting tackle (Sec. 23).—

- (a) Shall be examined by a competent person at least once in every 6 months and a register containing the prescribed particulars kept.
- (b) No new chains, rope or lifting tackle shall be taken into use unless previously tested by a competent person and a record of such test made in the register.
- (c) Chains and lifting tackle, except rope slings, shall be annealed at least once in every 14 months; chains or slings of $\frac{1}{2}$ in. bar or less, once in every 6 months. If not in regular use annealing is required only when necessary (a record is to be kept).

114. Cranes and other lifting machinery (Sec. 24).—

- (a) Shall be examined by a competent person once in every 14 months and a register kept.
- (b) As with 113 (b) above.
- (c) Safe working loads must be plainly marked on the machine.

115. Hoists and lifts (Sec. 22).—

- (a) Shall be examined by a competent person at least once in every 6 months and particulars kept in a register.

116. Steam boilers (Sec. 29).—

- (a) Shall be examined by a competent person at least once in every 14 months and after any extensive repairs.
- (b) Examination is to be carried out in accordance with the requirements of the Act and a report kept in the prescribed register.
- (c) New boilers require a certificate from the manufacturers.

117. **Air and steam receivers and steam containers (Sec. 30 and 31).**—The above are to be examined by a competent person at least once in every 26 months and a report made on Forms 59 or 58 and kept in the register.

118. (a) Testing under Sec. 23 (Chains, ropes, etc.) and Sec. 24 (Cranes) will be carried out by the Engineering Department in accordance with specifications supplied by the Safety Officer.
- (b) Hoists and lifts will be examined by the Engineering Department.

119. The examination in respect of steam boilers, receivers, containers, and air receivers will be carried out under contract by the Insurance Inspector.

120. The Engineering Department are responsible for the maintenance of the above records.

ISSUE OF LIFTING TACKLE AND LADDERS

121. The issue of lifting tackle and ladders will be made by the Foreman in charge of the Tackle Stores, who is responsible for their recall for testing and maintenance.

122. Issues to Sections will only be made on written requests specifying requirements.

123. The tackle is not to be used to lift weights greater than the safe working load shown on the tackle.

124. The Head of the Section will be responsible for seeing that :—

- (a) The tackle is kept in good order.
- (b) Ropes are not used in the presence of acid or acid fumes.
- (c) Ladders do not remain about the plant longer than is necessary, but are returned to the Section Store after use.
- (d) Any defect is at once reported to the Foreman of the Tackle Stores.
- (e) Tackle is at once returned on the request of the Foreman of the Tackle Stores.
- (f) Fixed tackle is not removed without the permission of the Foreman of the Tackle Stores.

FENCING AND GUARDING OF MACHINERY, PITS AND VESSELS (Factories Act, 1937)

125. Machinery, whether prime movers, transmission gear or otherwise, shall be fenced and/or guarded so as to render the machine safe to work. All pits and vessels containing dangerous liquid (hot water is considered dangerous) must be either closed in, or adequately fenced to a height of 3 feet above the ground or the platform surrounding.

126. Foremen are to ensure that all guards and fences are securely in place on all machinery before use.

127. The Safety Officer is to be consulted regarding the adequate guarding and/or fencing of machinery. He is to inspect all running machinery every month.

PORTABLE ELECTRICAL ENGINEERING EQUIPMENT

128. The following procedure will be adopted as regards all portable electrical engineering equipment such as drills, hammers, grinding wheels, lamps, grinding attachments, etc., having flexible leads :—

- (a) No new portable electrical equipment shall be put into service until it has been inspected by the Engineering Department Electrical Section, who will attach a certificate authorising its use for the next 3 months.
- (b) The user will hold the certificate and will be responsible for the return of the equipment to the Engineering Department Electrical Section every 3 months for further inspection and renewal of the certificate.

- (c) Any cable leads used with the equipment will be returned and inspected at the same time.
- (d) Should any defect develop between times of inspection, the user will immediately return the equipment to the Electrical Section for attention.

TOOLS

129. (a) Worn tools, mushroomed-headed chisels, split handles, etc., are not to be used. The fact that the tools may be the personal property of the tradesman does not permit their use if they are in a dangerous state.
- (b) The foreman in charge of each department, *e.g.*, Machine Shop, Electricians, Plumbers (Chemical), Woodworkers, etc., is responsible for carrying out a monthly inspection and rejecting such tools as he considers dangerous.
- (c) A certificate is to be rendered on the last working day of each month to the senior engineer (maintenance) that the inspection has been carried out.

CYLINDERS AND DRUMS OF LIQUEFIED OR COMPRESSED GASES

130. (a) Cylinders or containers must be handled carefully and must not be dropped or bumped.
- (b) Valves and cylinders must be kept clean, and valve sockets must be "snifted" before attaching any fitting to ensure that they are free from loose dirt.
- (c) Cylinders must be strapped to a bench or carrier and stand in a platform or well base when in use.
- (d) Cylinders or containers must not be stored near heat or combustible materials, or in places where corrosion or contact with oil and grease is likely.
- (e) Gauges showing pressures other than those recommended by the gas suppliers must not be used.
- (f) Valves or gauges should be tested for leakage. Tests should be carried out if required by applying soap solution to the valve socket and gland nut ; naked lights or flame must not be used.

SAFETY APPLIANCES

Chemical Works Regulations (No. 6) requires that a sufficient supply of :—

- (a) Breathing apparatus
- (b) Oxygen and suitable means for its administration
- (c) Life belts

shall be provided where dangerous gases or fume is liable to escape.

Gas and dust masks.—

- 131. (a) Gas masks must be worn before entering a building where there may be a *light* concentration of gas or fume.
- (b) Gas masks and canisters are to be provided wherever there is a liability of dangerous gas or fume arising. These masks will be inspected weekly by the Safety staff and replaced if necessary.
- (c) After the gas masks are used the Foreman is responsible for obtaining replacements from the Safety Officer ; these must be installed before the process is recommenced.
- (d) In any process where a dust or other impurity likely to be injurious is given off, suitable masks are to be worn (Factories Act, Section 47).

Breathing apparatus.—

- 132. If the concentration of gas or fume is heavy, breathing apparatus must be used.
- 133. (a) Compressed air breathing apparatus is placed at convenient points throughout the establishment, for use in emergency.
- (b) This apparatus will be inspected monthly by the Safety Officer, and a record kept of such inspections.
- (c) Scientists in charge must ensure that a suitable number of their staff are trained and practised in the use of this apparatus. The Safety Officer is responsible for training, and will maintain a record of staff so trained.
- 134. Gas casualties are not to be allowed to walk but must be taken by stretcher or ambulance to the hospital for treatment.

Baths, goggles, gloves, etc.—

135. Where grit or foreign substances may be ejected by force—*e.g.*, grinding operations, chipping of bricks, etc., protective goggles must be worn.

- 136. (a) Where strong acids or dangerous corrosive liquids are used and injury through splashing or otherwise is possible, safety baths, eye wash bottles, goggles and rubber gloves are to be provided.
- (b) The Foreman is responsible for seeing that :—
 - (i) The gloves are collected, cleaned and examined each day, and repaired or renewed as necessary.
 - (ii) Eye wash bottles are provided and kept filled with distilled water in a clearly marked cabinet.
 - (iii) Safety baths are kept filled with clean water.
- (c) Acid proof clothing is to be kept in the Foreman's office for use where there is an escape of dangerous liquid, *e.g.*, acid, ammonia.
Breathing apparatus is to be worn underneath this clothing.

137. First Aid boxes distinctly marked are to be provided in the Foremen's offices and laboratories. The person in charge of these boxes is responsible for ensuring that they are checked over weekly and replacements obtained from the Surgery.

138. Life belts will be issued from the Safety Office as required.

SAFETY PRECAUTIONS FOR LABORATORIES

- 139. Separate laboratories or parts thereof are to be allocated for work on different types of explosives.
- 140. As small an amount of explosive as possible should be brought into the laboratory at one time. Explosives must not be left uncovered.
- 141. Solvents and explosives are to be removed as far as possible at the end of the day to their appropriate store, where they are to be kept under clean conditions. Solvents are not to be kept in the same store as explosives, but a separate store maintained.
- 142. Filters and/or catchpots are to be fitted in sinks to prevent the passing of explosives into drains. The filters will be cleaned out regularly and the waste disposed of according to the laboratory instructions.

143. Acid should be returned to the plant as far as possible, but if poured into the sinks must first be thoroughly diluted.

144. Separate receptacles containing just enough water for complete covering of the contents must be kept for H.E. and propellant waste, and these are to be kept covered, away from possible contact with acids or alkalis, and removed to the central waste collecting centre daily. No initiating explosives are to be placed in the waste receptacles but are to be dealt with in accordance with the special regulations laid down by the scientist in charge.

145. Solvents are to be clearly labelled and are to stand in metal trays to prevent dripping on to the floors.

146. Waste solvents are to be returned to containers clearly labelled "Waste . . ." and these containers are to be emptied at regular intervals into waste solvent containers at the central waste collecting centre for burning, unless recovery has been authorised by the scientist in charge. Waste solvents are not to be kept in bottles fitted with ground glass stoppers or cocks.

147. Bottles containing acid are only to be conveyed in the special carriers provided. They should be placed in drip trays, and not allowed to stand on wooden benches.

148. Solvent drums are only to be opened under non-sparking conditions with the non-ferrous tools provided.

149. Special Rules regarding limits, conduct of operations, face protection, wearing of goggles or gas masks and toxicity, will be issued in writing by the scientist in charge in respect of each programme. Unauthorised experimental work is forbidden.

150. All fire appliances are to be kept in good order and ready for use. It is the responsibility of the scientist in charge to ensure that the necessary equipment is obtained from the fire brigade.

151. All gas burners are to be extinguished when not required and the main supplies to the building turned off at cessation of work each day, except when required for special work when the Temperature Recorders are to be advised.

PROCEDURE IN CASE OF FIRE DURING WORKING HOURS

152. The person first discovering a fire will summon anyone working in the vicinity to his aid and endeavour to put it out. If unable to extinguish the fire IMMEDIATELY he will operate the nearest fire alarm or telephone the switchboard operator.

153. The senior person present at the scene of the fire will take charge until the arrival of the Fire Brigade and will see that immediate steps are taken to extinguish the fire with the emergency apparatus available.

154. If the fire involves organic solvents, oils or other liquid combustible material immiscible with water, WATER must NOT be used. Sand, earth, foam extinguishers, blankets or rugs only will be used in such cases.

155. Water must not be directed on to electric wires or apparatus.

156. If more than small quantities of explosives are present in the immediate vicinity of the fire and are likely to be involved, all persons in the neighbourhood are to be warned to take cover. Measures taken to extinguish the fire will be conducted from behind cover. No one is to enter the building or traverse without permission from the senior official present.

157. To avoid the spreading of the fire the following steps will be taken :—

- (i) Gas or electricity will be at once cut off from the building in which the fire has occurred.
- (ii) All doors and windows in the vicinity will be closed.
- (iii) All inflammable material will, as far as possible, be removed from the immediate neighbourhood.

158. When the local fire alarm is sounded all auxiliary firemen will at once report to their area assembly point and await instructions.

ACTION IN CASE OF SERIOUS ACCIDENTS OR FIRE**Action by the senior person present.—**

159. (a) DIAL 222
requesting ambulance and/or Fire Brigade, and arrange
if necessary for First Aid to be rendered.
- (b) Dispatch workmen to fetch stretcher, and, if required,
rail ambulance carriage.
- (c) Arrange for the senior worker present to prepare best
position for ambulance or stretchers.
- (d) Arrange for nothing to be disturbed apart from the
necessary rescue work.
- (e) Arrange for the Foreman to take a roll call.
- (f) Telephone the Superintendent of the branch.

160. Action by the switchboard operator.—

- (a) Pass the call through to the Fire Brigade.
- (b) Give priority to incoming calls from the Fire Brigade.
- (c) Advise the Safety Officer or Deputy.

APPENDIX A**DANGER BUILDING CLEARANCE CERTIFICATE**

Building..... Section
 Nature of work :
 B.W.D.
 Electrical
 Machinery
 Plumbers

Safety Visitor.

All explosives have been removed and plant isolated.

.....19.....
 Foreman.

Scientist in charge.

Safe for work to proceed except as noted overleaf.

.....19.....
 Safety Visitor.

Foreman (Trades Section).

You are authorised to commence work at once, subject to
 the precautions noted overleaf.

.....19.....
 Scientist in charge.

Scientist in charge.

Work completed.

.....19.....
 Foreman (Trades Section).

Scientist in charge.

Plant, machinery and building thoroughly cleaned and
 ready for operation.

.....19.....
 Safety Visitor.

Building and plant ready for operation.

.....19.....
 Scientist in charge.

APPENDIX B

RULE READING CERTIFICATE

Safety Officer.

I certify that the rules and amendments as advised have been read to all workers present under my control.

..... 19.....
Foreman.

APPENDIX C

.....Section.

Certified that the plant attached (description).....

.....
is free from explosive and/or acid and/or dangerous liquid and is ready for repair/disposal.

Date.....

APPENDIX D

CLEARANCE CERTIFICATE FOR REPAIR OF PLANT.

Serial number.....

Chemical Works Regulation No. 7.

(i) DOES APPLY to this job and the person handing over has seen the signature of the Responsible Person in the Special Book, Regulation 7, Certificate No.....

(ii) DOES NOT APPLY.
(One of the above statements must be struck out).

Certified that :-

(a) The Machine or vessel is isolated from every dangerous source of gas and liquid and motive power.

(b) The machine or vessel is not isolated from every dangerous source of gas and liquid and motive power. Any special precautions to be taken are detailed below.

(One of the above statements must be struck out).

Signature..... Date..... Time.....
(Person handing over).

SECTION OF PLANT		HANDED BACK.	
HANDED OVER.		HANDED BACK.	
Job to be done and special precautions to be taken	Signature of Parties concerned	Particulars of Job done	Signature of Parties concerned
	Date		Date.....
	Time		Time
	<i>Renewed.</i>		
	Date		
	Time		
	<i>Renewed.</i>		
	Date		
	Time		
	<i>Renewed.</i>		
	Date		
	Time		

If Chemical Works Regulation No. 7 applies, the person taking back the plant after completion of the job MUST NOTIFY the Responsible Person (see (i) above) that the job is complete and this clearance certificate is signed off.

APPENDIX E**CHEMICAL WORKS REGULATIONS, 1922****Regulation 7**

Certificate No.....

Certified that the under-noted place which requires to be entered and in which there is reason to apprehend the presence of dangerous gas or fume :—

- (a) Is isolated and sealed from every source of such gas or fume and is free from danger.
- (b) Is not so isolated and sealed from every source of such gas or fume and free from danger, and therefore must not be entered by any person unless he is wearing a "breathing apparatus" and (where there are no cross-stays or obstructions likely to cause entanglement) a "lifebelt," the free end of the rope attached to which shall be left with a man outside whose sole duty shall be to keep watch and to draw out the wearer of the lifebelt if he appears to be affected by gas or fume.

(Either (a) or (b) must be crossed out in full.)

Particulars of place referred to :—

Date and time.....

Signature.....

(of responsible person appointed for the purpose).

Renewed :

Date and time..... Initials.....

Renewed :

Date and time.....

Renewed :

Date and time.....

Renewed :

Date and time.....

COMPLETION OF JOB : This Regulation 7 Certificate is hereby cancelled.

Date and time..... Signature.....

APPENDIX F

Safety Officer. **PERMANENT
APPLICATION FOR TEMPORARY FIRE.**

Date	Time	Place	Method of Lighting	To be Lighted by	To be Extinguished by
Have solvents been used for cleaning purposes :— Special precautions :— <p>.....19.....</p> <p>..... Head of Section</p> <p>..... for Superintendent</p> <p>..... Head of Section</p>					
Approved19.....					
I certify that the fire has been extinguished.19.....					
Note :— This authority should be returned to the Safety Officer, immediately after the completion of the service for which the fire is authorised.					

APPENDIX G

Safety Officer.

The following ^{TEMPORARY} alterations in (limits) are
 PERMANENT (use lists)

required in.....house,.....section, for the

purpose of

Limits :—

Explosives. lb. Use Lists :—

Workmen.

Rules.

Head of Section.

Superintendent,

Forwarded.

Safety Officer.

Safety Officer,

Approved.

Superintendent.

Head of Section,

Please note.

Safety Officer.

Safety Officer,

Noted and arranged.

Head of Section.

APPENDIX H

**BRITISH STANDARD IDENTIFICATION COLOURS FOR
 GAS CYLINDERS, EXCLUDING CYLINDERS FOR
 MEDICAL PURPOSES**

<i>Gas</i>	<i>Ground Colour of Cylinder</i>	<i>Colour of Bands</i>
Acetylene	Maroon	None
Air	Grey	None
Ammonia	Black	Red and Yellow*
Argon	Blue	None
Carbon Dioxide, for temper- ate use	Black	None
Do. for tropical and marine use	Black	White or alum- inium paint
Carbon monoxide	Red	Yellow
Chlorine	Yellow	None
Do. cylinders fitted with in- ternal dip pipes	Yellow	Black
Coal Gas	Red	None
Ethyl Chloride, inflammable	Grey	Red
Do. non-inflammable	Grey	None
Ethylene	Mauve	Red
Helium	Medium Brown	None
Hydrocyanic Acid	Blue	Yellow
Hydrogen	Red	None
Methane	Red	None
Methyl Bromide	Blue	Black
Methyl Chloride, inflam- mable	Green	Red
Do. non-inflammable	Green	None
Neon	Medium Brown	Black
Nitrogen	Dark Grey	Black
Oxygen	Black	None
Phosgene	Black	Blue and Yellow*
Sulphur Dioxide	Green	Yellow

* The red or blue band shall be placed adjacent to the valve fitting and the yellow band between that and the ground colour of the cylinder.

APPENDIX I
COLOUR CODE FOR IDENTIFICATION OF PIPING

<i>Service</i>	<i>Colour</i>	<i>Colour of band</i>	<i>B.S. No. for paint</i>
Water	Cold	Nil	101
	Hot	French blue	101 & 166
Steam	Crimson	Nil	None available
Gas	Green	—	218
	Orange	—	557
Electricity	Orange	—	557
Refrigerated brine	Light grey	—	631
	White	—	None available
Compressed air	White	—	None available
Vacuum	Black	—	None available
Fire	Signal red	—	B.S. 537

Condensate two rings against long band for steam

D.C. to be added—black transfer

Bands are to be placed at all joints and should extend for at least 6 inches from the joints.

APPENDIX J

LOCKER MAGAZINES

Locker magazines under the control of the Heads of Sections are provided for small quantities of ready use explosives, for experimental explosives and for those whose stability is doubtful. The quantity of explosive in each locker should be kept as small as possible and in no case is it to exceed the following limits:—

High Explosives	8 lb.
or Propellants	8 lb.
or Fulminate class	1 lb.
or Gunpowder and Pyrotechnic Compositions ...	2 lb.

Each package put in any magazine must be labelled with its contents, the name of the scientist and the date upon which storage commenced. No explosive package or container is to be opened in the locker enclosure.

The types of explosives mentioned above must not be mixed in any one locker. While the doors of the magazines or of the enclosure are being opened or closed, explosive samples must be put on the shelves provided and not on the ground. Unless absolutely necessary, explosives should not be retained when the work for which they were obtained is finished. The contents of locker magazines should be reviewed every 3 months, and only those explosives whose retention is essential should be kept. The person using the magazine is responsible that it is afterwards securely locked and the keys returned to the appointed place.

INDEX

	Page No.	Rule No.
A		
Access to dangerous places ...	28	125
Accident serious, procedure ...	34	159
Acid proof clothing ...	31	136 (c)
Administration of rules ...	4	1-4
Air Receivers ...	27	117
Alteration to Limits, Special Rules ...	15	60
Alterations, repairs (Danger Buildings) ...	15	63-75
Aluminium paint (not to be used)	12	47
Approach to Danger Buildings ...	12	48
Area, definition of ...	5	8
Articles, prohibited ...	6	11
Assistant Foremen (duties of) ...	—	2, 16, 18, 28, 34, 45, 50, 53, 80, 126, 129, 131, 136
Authorisation for taking over buildings ...	14	56
B		
Bags, containing explosives to be tied ...	11	43
Baths, safety ...	31	136
Belts, or revolving shafting ...	8	29
Blows or friction to be avoided in handling explosives ...	11	42
Boots and Shoes (danger buildings) ...	10	39
Breathing apparatus ...	30	132
C		
Care in work	10	42
Chains, lifting tackle, etc. ...	26, 27	113, 121
Chemicals (prohibited) ...	6	11
Chemical plant (repair of) ...	20	85-90
Chemical Works (Clearance Certificate) ...	38	Appendix E
Cleaning of machines in motion (prohibited) ...	9	29

	Page No.	Rule No.
Cleaning of trucks ...	11	44
Cleaning or Repair Work (Explosives plant) ...	15	63-73
Cleaning or Repair Work (Chemical plant) ...	20	85-87
Cleaning or Repair Work ...	21	88-90
Cleanliness of (Danger Buildings)	11	44
Cleanliness (Explosives receptacles) ...	11	43
Cleanliness (Factory) ...	8	24
Clearance Certificates ...	—	Appx. A, C, D and E
Clearance procedure, Danger Buildings ...	15	63-73
Clearance procedure for explosives plant ...	18	79
Cleansing centres ...	18	79
Closing of buildings ...	7, 12	20, 50
Compression ignition engines ...	7, 12	15 (a), 48
Colour code (piping) ...	42	Appendix I
Conduct in factory ...	7, 8	17, 22
Containers for cotton waste and sponge cloths ...	8	25
Contraband, possession of ...	6	11
Covers to be kept on explosives receptacles ...	11	43
Cranes, etc. ...	27	114
Cylinders (liquefied or compressed gases) rules for ...	29	130
Cylinders (for liquefied or compressed gases—colour code)	41	Appendix H
D		
Danger Building (clothing) ...	6	11
Danger Building (footwear) ...	10	39
Danger Building (definition) ...	5	6
Danger Building Rules ...	10	38-50
Danger Building Clearance certificate ...	35	Appendix A
Danger Building, cleanliness ...	11	44
Danger Building, footwear ...	10	39
Danger Building Limits, Special Rules ...	14	57-62
Danger Building, opening for work	10	38

	Page No.	Rule No.
Danger Building, repairs ...	15	63-73
Danger Building repairs (emergency) ...	17	74-78
Danger Building searching ...	6	12
Danger Building Tools ...	11	42
Dangerous articles prohibited ...	6	11
Dangerous conduct ...	7	17
Dangerous places, access to ...	9	29, 32
Defective lamps, replacement ...	8	23
Definitions ...	5	5-9
Depositing of food ...	6	14
Disconnecting pipe lines ...	9	33
Disposal of waste explosives and solvents ...	26	107-112
Doors of buildings in use ...	10	38
Driving belts and machinery in motion ...	9	29
Drums (solvents) ...	25, 32	100, 102, 148
Dust masks ...	30	131
E		
Economy in use of materials ...	8	26
Electric and gas fittings ...	8	23
Electric equipment (inspections) ...	8	23
Electrical equipment (portable) ...	28	128
Entering and leaving building ...	6	9
Entering Station ...	6	10
Exits from building ...	7	19
Experiments in danger buildings not permitted ...	11	42
Explosives and explosives receptacles ...	11	43
Explosives spilled ...	11	45
Explosive trucks (rules for) ...	12	51
Eybottles, use of ...	31	136 (a)
Eyeshades and goggles to be worn ...	10, 31	37, 135
F		
Factory cleanliness ...	8	24
Failure of electric lighting ...	8	23
Fencing of pits and guards to be used ...	8	29
Fire Brigade Officer (duties of) ...	30	133
Fire fighting rules ...	33	152-158

	Page No.	Rule No.
Fire fighting equipment ...	8	27
Fire Pass (application for) ...	39	Appendix F
Fire Pass (authorisation for) ...	7	15
Fires, definition of ...	7	15 (a)
First Aid equipment and staff ...	8	28
Flaming procedure ...	19	81-84
Floors (care of) ...	16	67
Food, consumption of ...	6	14
Food, depositing of ...	6	14
Footwear (danger building) ...	10	39
Forbidden articles ...	6	11
Foreman, duties of ...	—	2, 16, 18, 28, 34, 45, 50, 53, 80, 126, 129, 131, 136 121-124
Foreman, Tackle Store, duties of ...	27	121-124
Frozen explosives ...	25	99 (k)
G		
Gas and electric fittings ...	8	23
Gassing casualties ...	10, 30	36, 134
Gas cylinders (colour code) ...	41	Appendix H
Gas, use of ...	30	131
Gas masks ...	30	131
Glassware, broken ...	26	107
Grass cutting ...	12	49
Gloves to be worn ...	31	136 (a)
Goggles to be worn ...	10, 31	37, 135
Guards and fencing to be used ...	8	29
Guarding of belts ...	28	125-127
H		
Handling of explosives and receptacles ...	11	43
Heating pipes ...	12	46
Hoists and lifts ...	27	118 (b)
I		
Inflammable liquids, and drums containing ...	25	100-106
Infringement of rules ...	4	4
Inspection of buildings, before closing ...	7	20

	<i>Page No.</i>	<i>Rule No.</i>
Inspection, repairs, alterations danger buildings	15	63-73
Instructions Operating, for danger buildings	14	57-62
Interference with factory equip- ment	8	22
Internal combustion or steam engines	12	48
Irresponsible conduct	7	17
Issue and return of ladders, scaffolding, and lifting gear	27	121-124
K		
Keeping of rule book	4	1
Keys	7	18
L		
Laboratory, definition of	5	7
Laboratory, safety procedure	31	139-151
Ladders, issue of	27	121
Ladders, use of	9	30
Lamps, electric, replacing of	8	23
Leading Workers, duties of	—	12, 16, 20, 27, 38, 39, 41, 68, 90, 159 (c)
Lead (salvage)	22	92
Leather (contaminated), salvage	19	81
Leaving the station	6	10
Life Belts	31	138
Lifting tackle, issue and return of	27	121-124
Lifting tackle, inspection of	27	121
Limits, danger buildings	14	57
Limits, amendment of	40	Appendix G
Loading of trucks	12	52
Locker Magazines	43	Appendix J
Locking of buildings not in use	7	20
Locomotives, movement of	13	53
M		
Machinery in motion (cleaning of)	8	29
Machinery out of order to be reported	8	21
Man Limit (danger buildings)	14	57

	<i>Page No.</i>	<i>Rule No.</i>
Matches, prohibited	6	11
Means of ignition, authorised only to be used	7	15
Medicines, prohibited	6	11
Metal containers, for oil, etc., waste	8	25
Minor and running repairs in danger buildings	17	74-78
N		
New explosives plant (inspection)	14	56
Nitrous fumes and toxic gases	10, 30	36, 132, 134
Noise, undue to be avoided	7	17
Notification of Fire Brigade	33	152-158
O		
Opening danger buildings for work	10	38
Operating Instructions (Danger Buildings)	14	57-62
Orders to be obeyed	7	16
Own work to be kept to	8	22
P		
Packages in open trucks	13	52
Passage ways not to be obstructed	7	19
Pipe lines, disconnecting	9	33
Pipe lines, colour code	42	Appendix I
Planks not to be placed across uncovered vessels	9	32
Plant, repairs of	15-19	63-90
Plant removed from danger build- ings	18	79
Plant clearance certificate	37	Appendix D
Points (Railway)	13	54
Police authorised to search	6	12
Portable electrical equipment	28	128
Procedure before repairs, altera- tions, etc., in danger build- ings	15	63-65
Procedure during repairs, etc., in danger buildings	16	66-68
Procedure after repairs, etc., in danger buildings	16	69-73
Prohibited articles, list of	6	10
Proof Stands, definition of	5	9

	Page No.	Rule No.
R		
Reading of Rules	4	2, 3
Removal of all explosives before repair not required	17	74-75
Removal of floorboards, hand-rails, etc.	9	35
Removal of waste explosives	26	107-112
Removal of waste (service)	8	24
Repairs, alterations, etc., in danger buildings	15	63-75
Repair work (non-explosives)	20	85-90
Repair work on explosives plant	19	80
Replacing electric lamps	8	23
Reporting of Rule Reading	4	2
Reporting of grievances	7	16
Respirators	30	131
Roll call after accident	34	159 (e)
Ropes, use of	9, 28	30, 124
Rule book, keeping of	4	1
Rule reading, certificate... ..	36	Appendix B
Rules, disciplinary action for infringement	4	4
Rules, reading of	4	2-3
Rules, transport of explosives	51, 98	12, 24
Running or minor repairs in danger buildings	17	74-75
S		
Safety baths	31	136 (a)
Safety Regulations	14	
Salvage	22	91-94
Salvus equipment	30	133
Scaffolding, erection and use of	9	31
Searching	6	12
Security of buildings	7	20
Smoking, prohibited	6	13
Special Rules (Danger Buildings)	14	57-62
Spilling of explosives	11	45
Spilling of acids and dangerous liquids	9	34
Solvents, storage and use of	25	100-106
Sponge cloths, use of	8	25
Stationary trucks	13	55
Steam boilers	27	116
Steam engines	12	48

	Page No.	Rule No.
T		
Steam receivers and containers	27	117
Steam pipes	12	46
Sticks and Umbrellas	10	40
Storage of Explosive and ammunition	22	95-97
Sunlight, explosives not to be exposed to	11	43
Tackle Store (Issues from)	27	121-124
Taking of buildings and plant into use	14	56
Telephones, use during thunderstorm... ..	12	50
Temporary Special Rules, Use Lists	15	58
Thunderstorms, action during	12	50
Timber (contaminated salvage)... ..	19	81
Tobacco, prohibited	6	11
Tools in danger buildings	10	42
Tools, care of and examination	29	129
Toxic fumes	10	36
Traffic rules	13	51-55
Transport of explosives	24	98-99
Treatment of persons affected by fume	10, 30	36, 134
Truckers, duties of	12	51-55
Trucks, cleaning of	11	44
Trucks, movement of	13	53
Trucks, explosives	13	51
Trucks, stationary	13	55
U		
Unauthorised experiments	11	42
Undue noise	7	17
Unnecessary articles, accumulation of	8	24
Unsafe conditions, notice of	9	35
Unusual appearance of materials, plant, etc.	8	21
Unusual occurrences to be reported	8	21
Upsetting or spilling of explosives	11	45
Use Lists	14	57 (d)
Use Lists (amendment of)	40	Appendix G
Use of goggles and eyeshades	10, 31	37, 135

	<i>Page No.</i>	<i>Rule No.</i>
V		
Valves, disconnecting	9	33
Vessels containing dangerous substances	9	32
W		
Waste (explosives)	26	107-112
Waste solvents	26	107-112
Waste solvents, laboratories ...	32	146
Welding in explosives buildings...	19	81-84
Working at heights	9	31

4

13866

W

WRIGHT A/F

MISCELLANEOUS NOTES

Code 28-74-0



SUPPLIED FOR THE PUBLIC SERVICE

INDEXED
NOTE BOOK
No. 136

W

L.F. 302

13/11/47

The making of Dithakite

On Thursday with two men
from Woolwich, we made

800 lbs 12 oz total D.13

we made it in four miscings
each miscing, total weight

199 lbs 12 $\frac{3}{4}$ oz

Each miscing made with

151.0 lbs of Nitric Acid 82 %

+ 48 lbs 12 $\frac{3}{4}$ oz of Nitro-Benzene

When all miscing run into

Drum, finally added is

1 lb 9 oz Phosphoric Acid

The empty Drum weighed 181.9 lb
while miscing temperature kept at 90°

L5/3219

D. 20

Acid 800 lbs

HNO_3 74.2%

 620 lbs $6\frac{1}{2}$ oz

Potassium 179.9 $\frac{1}{2}$ oz

Batch { Acid weight 154.1 $\frac{1}{2}$ oz
Potassium 44.14

Soft Putty

To be used for Jointing
Acid Earthenware.

Ingredients:-

Asbestos Powder	25	lbs
" Fibre	5	"
China Clay	6	"
Boiled Linseed Oil	14	"

50

Aug WE. 18 + 25 Sept 1.

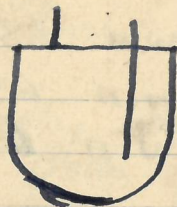
Compression of NO/H_2

Experiment

Nitric Oxide + Hydrogen.

was tried out with

300 lbs of each gas
400 " " Gas



MONTÉJUS Blowing Egg

Brought by Machine

R.H. 1912

Undine Eye Wash
Bottle

Magnifying Glass
issued to:

Graddock, J W.A. 6538
Smith, L W.A. 6515
Smith, T W.A. 6543

late Duty taken for 1950
Jan To June

W.E. 7/1/50 Clements, E 574
" 14/1 " Saunders, T 577
" 21/1 " Shinkins, J 580

B, O, C 6359

First Aid Box

Length Width Height
6' 2" 1' 2" 1' 1"

(Colloquium)

W.A.F. 1.

Furfuryl Alcohol 40%
Aniline 30%

Quantity in Litres for
5 Galls W.A.F. 1.

40% 15.750 Litres Furfuryl, Al.
 6.750 " Aniline
 22.500 Litres = 5 Galls

6-X

Health, L 570

Late Duty Attendant for NE 5/7/52

Mon.	5:55 P _m =	$\frac{11}{12}$
Tues.	5:55 P _m =	$\frac{11}{12}$
Wed.	5:50 P _m =	$\frac{10}{12}$
Thurs.	5:50 P _m =	$\frac{10}{12}$
Fri.	5:50 P _m =	$\frac{10}{12}$

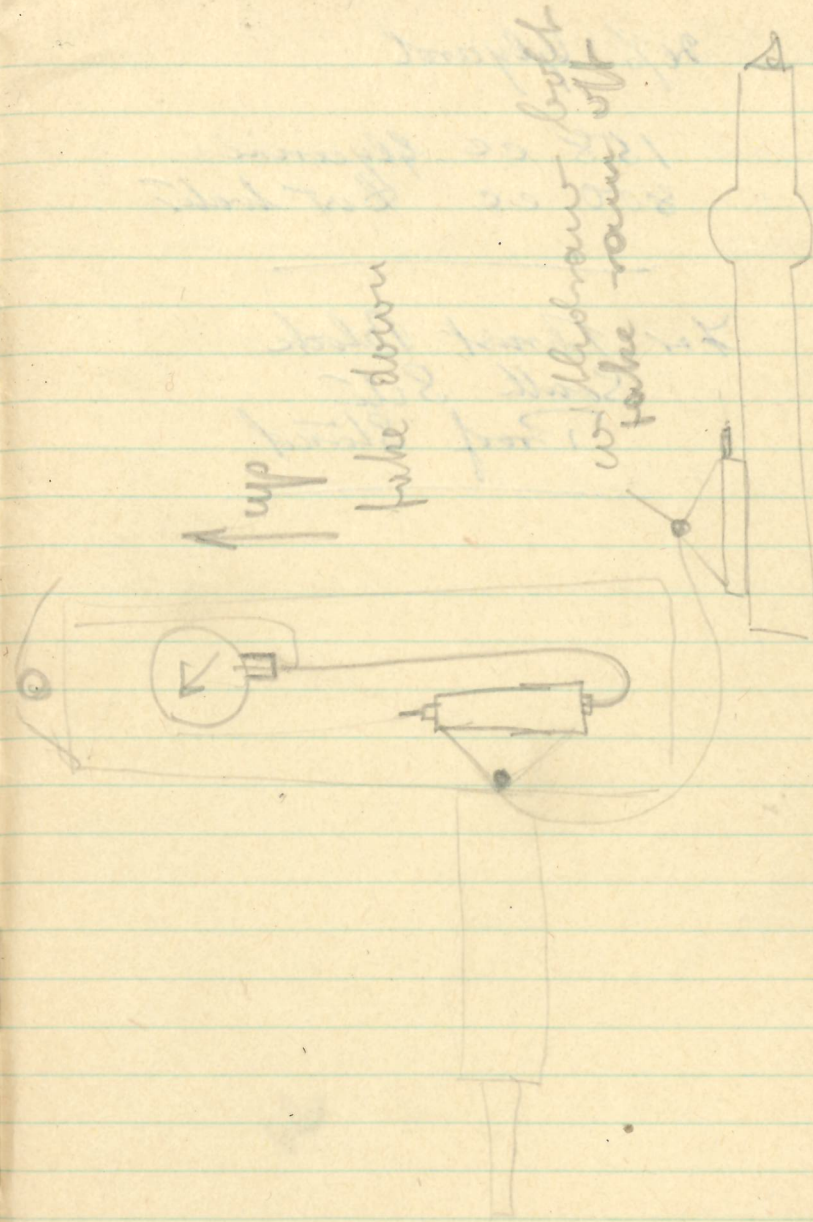
U
V
W
Y

6-X

Health, L 570
Late Duty Attendant for NE 5/7/52

Mon.	5:55 P.M.	=	$\frac{11}{12}$
Tues.	5:55 P.M.	=	$\frac{11}{12}$
Wed.	5:50 P.M.	=	$\frac{10}{12}$
Thurs.	5:50 P.M.	=	$\frac{10}{12}$
Fri.	5:50 P.M.	=	$\frac{10}{12}$

U
V
W
Y



20% Glycerol

158 cc Glycerine

800 cc Dist water

For Thrush Blocks

South Side

Proof Stand

Names

[Faint, illegible handwriting on the right page, possibly bleed-through from the reverse side.]

NAMES

Blaker Promoted To Staff ~~202~~ June B Special
 Pike 230 R. E. III
 Barthine Promoted To Staff ~~331~~ May grade III
 Fletcher F 1028 } Lab
 Miles, V. I 1035 } blamers
~~Rushkin 455 } Fitters~~
 Farman, A 494 } Labourer
 I.

Bldg P Y 21
 South Site

I. 18.
A. R.

NAMES

NAMES	No	Grade
HEATH. L	570	A.
SKINNER. F	571	B.
TAYLOR. F	572	B.
SKINNER. A	573	B.
CLEMENTS. E	574	B.
WILSHEER. G	575	B. 1/4
PASK. E	576	B.
SAUNDERS. T	577	B.
SMITH. W	578	B. 1/4
SHINKINS. J	580	B.
SMITH. T	581	B. 1/4
BARNARD. J	583	B.
ADAMS. A	441	B.
CREEST. J	480	C.
CARTER. J	555	B.
WILKINS. L	189	21/4/52
PLUMMER. A	198	STREMAN I
CRADDOCK. J	813	FITTERS
QUINN. J	816	
WOOD. A	819	
WODHAMS. S	843	
SCOTT. F	782	ELECTRICIAN
CLARKE. J.C	796	MATE

WRIGHT

S.O. Book 136. (Indexed.)

CODE 28-74-0.

MISCELLANEOUS. NOTES



T. 91-2389. Wt. Y4590. 22,500 Bks. 12/47. W. & S. Ltd. 273513F.

Beams of improved Alcohol
32

Depth 13 1/4" 30.05

Foreman's Office
Phone 243

30.50
05
00
30.556
30.55
30.556 55 cm 30.112

65 cases of
Reolast
arrived at South Side
Thursday 9/6/49

Injector 3.D
Hole Holes .082 diam.
Fuel .0100
(Diesel Oil)

For Stockingness 12/1/49
Trials

Two Separate Containers
with Eight Gallons of H.N.O₃
in each container
(4 Containers 4 Galls in each)
8 Gall = 36 Litres = 72 Litres
" = " " "

Two Separate Containers
with Fifteen Pounds of (30 lbs)
W.A.F.1

Density of W.A.F.1 1.11. 1948

453.6 grams = 1. Pint

15
22680
4536
11) 68040 (6185.5 = 6.186 Litres
double the quantity

Density of H.N.O₃ 1526

15260
4
61.040 61 lbs 4 oz
in each container

A
C
D
E
F
G
H
I
K
L
M
N
O
P
Q
R
S
T
V
W

W.A.F. 1.

Furfuryl Alcohol 70%
Aniline 30%

Quantity in litres for
5 Galls of W.A.F. 1.

70% 15.750 litres Furfuryl Al
30% 6.750 " Aniline
22.500 litres = 5 Galls

24/2/49

Furfuryl Alcohol
Density 1.140 Temp 12.0°

Three cans.

40 lbs

40 "

32 "

112 lbs

Despatched to Yarnborough

24/2 - 28/2/49

For Shoeburyness Trials

Four containers each with
4 Galls of H.N.O₃ V. Drum
Simple

(Two, cans of Kerosene)
30 lbs each.

Four cans 22 lbs in each

Sent 24/3/49

Injector 3 (a) Ratio 3-1
used with Run 346
8/3/49

The Four Valves of
Lubricate Pipe line need
a little Oil + grease about
once a month

greased + Oiled 24/3/49

C
D
E
F
G
H
I
K
L
M
N
O
P
Q
R
S
T
V
W

Calibration of Injectors
with water

18/3/49

Injector 3(b) 1

Fuel During 1 min Run

Pressure 5 Ats	8.8 Kg
" 10 "	13.5 "
" 15 "	16.9 "

Acid During $\frac{1}{2}$ min Run

Pressure 5 Ats	15.3 Kg
10 "	21.7 "

Calibrations Continued

Injector 3(b) 2 23/3/49

Fuel During 1 min Run

Pressure 5 Ats	8.4 Kg
" 10 "	11.4 "
" 15 "	14.1 "

Acid During $\frac{1}{2}$ min Run

Pressure 5 Ats	16.7 Kg
10 "	23.4 "

Tetrafluoroethylene.

Teflon or Fluon.

used for washers with $H_2N.O_3$
washers for flange etc. 99.0%

sent down

Despatched

30/3/49

1. Gallon Nitromethane

Mr. Bailey

CSAR E135

Woolwich

C
D
E
F
G
H
I
K
L
M
N
O
P
Q
R
S
T
V
W

2000 lbs Dead Load Yester
Received 5/4/49

3	weights	400 lbs each	=	1200 lbs
2	"	200 " "	=	400 "
3	"	80 " "	=	240 "
2	"	40 " "	=	80 "
2	"	20 " "	=	40 "
2	"	10 " "	=	20 "
2	"	5 " "	=	10 "
Base	"	- - - -	=	20 "
				<u>2010 "</u>

D
E
F
G
H
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M
Mc
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R
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T
V
W
Y

Densities

FUEL	DENSITY.	TEMP.
Aniline	1.022	12.5°
Alcohol (Absolute)	.797	10.0°
Petrol	.748	12.0°
Paraffin	.804	10.5°
Furfuryl Alcohol	1.145 1.140	12.0°
W.A.F. 1	1.110	19.5°
W.A.F. 2		
Heptane	.679 (687)	18.5°
Benzene	.879	20.0°
Hydrazine Hydrate	1.039	18°

D
E
F
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K
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M
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O
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Q
R
S
T
V
W

19/4/49

325. lbs W.A.F. 1.

900. lbs HNO_3
For Aberforth 25th April

975. lbs W.A.F. 1
For Australia

W.A.F. 1 was made up in
three containers two 109 lbs
+ one with 107 lbs.

Furfuryl Alcohol 31,500 litres
Aniline 13,500
For 109 lbs = 45,000 litres

Despatched to Aberforth
25/4/49

E
F
G
H
I
K
L
M
N
O
P
Q
R
S
T
V
W

DRUMS STENCELLED (for
W.A.F. 1 (despatch))

C.S. % DEPT OF S & D

SALISBURY S. AUSTRALIA

ATTN. MR. WEBSTER. C.E.A.D.

Despatched 17/5/49

14 Drums each containing

75 lbs W.A.F. 1 =	1050 lbs
24 " each drum	<u>336 "</u>
Gross weight	<u><u>1386 "</u></u>

273/5/4.

975. lbs W.A.F. 1 made
up for Australia

made up in Volume
70% Turpuryl Alcohol
30% Aniline

14 Litres F. Al. = 15 Kg 750 gm.

6 Litres A. = 6 Kg 100 gm

975. lbs W.A.F. 1 = 443 Kg
34.0 Kg in each ^{outside} _{drum} ^{brought}

Sample taken from one W.A.F. 1
drum for Mr. Adams & kept
at Temperature

Also Also sample taken from
Six Drums & used for ignition
of Run N° 396 using
Ethanol + H.N.O₃ Y 99.75%

F
G
H
I
K
L
M
N
O
P
Q
R
S
T
V
W

9 Litres of HNO_3 Sample Y

Collected for Major Ferguson
Fort Halstead 10/5/49

20 Gallons of Furfuryl Alcohol

for R. P. D Westcott

3 Drums = 91 Litres
(Measured up) 17/5/49

Despatched to Westcott
18/5/49

19/5/49

TRIALS AT SHORBURNNESS

MATERIALS TO BE READY BY MAY 25th

- 1) 50 LITRES of Nitric Acid in two
Bithelclic Containers
(25 litres in each. Sample Y 99.75%)
- 2) 16 LITRES of a Mixture of
20 Parts by Volume
Furfuryl Alcohol + 80 Parts
by Volume Aniline
- 3) 16 LITRES of Methanol
- 4) 16 LITRES Hexozene

	Litres
80 Parts Aniline =	12.800
20 - Furfurylall	3.200
	<u>Litres 16.000</u>

2, 3 + 4 Items are made
up Ready 25/5/49
for Despatch
Despatched 30 May

F
G
H
I
K
L
M
N
O
P
Q
R
S
T
V
W
Y

weighed up 22/6/49

224 lbs FURFURYL ALCOHOL

LETTER REF. SD/9R/35

R.A.E FARNBOROUGH

Despatched 23/6/49

Connect ^{Pressure} New Recorder
in conjunction
with Throat & Pressure
one already there

4 Galls Hydrazine
Hydrate
for Dr Cooper's Lab

Wed 6th 6

Smith }
Clements }

Received containers ^{8/7/49}
back from South Side
which have been
Packed in Acid

Sun Shinning on Acid
Sight Glasses (Test)
^{8/7/49}

Temperature + Density
Taken 3.40 PM

Temp 19° Density 1.513

Taken again 4.10 PM

Temp 23° Density 1.508

G
H
I
K
L
M
Mc
N
O
P
Q
R
S
T
V
W
Y

11/7/49

Sun Shining on Acid
Sight Glass

Time	TEMP	Density
3.0 PM	23.5°	1.507
3.30	26.0	1.504

18/7/49

Stainless Steel
Containers for
Shoeburyness Trials

inner container
Holds 3 Litres
leaving $3\frac{1}{2}$ " (Ulage)
from top

outer container

Holds 2 Litres 250 c.c.
Leaving $3\frac{3}{4}$ " (Ulage)
from top

Run 452
Separation of WAF.I

31 cc

at 1.15 PM 90 cc WAF.I
" 97 cc Kerosene

187 cc

H
I
K
L
M
N
O
P
Q
R
S
T
V
W

18/7/49

Run	451	in	60
	452		60
	453		65

19/7/49

Aluminium Shield
in front of
Acid Reserved Tank

19/7/49
Lock in Cupboard
in Letter Shop
H.16 Bay 1

New lock for
Laboratory's Change Room

21/7/49

First Run No 441

Cutting down W.A.F.1
to lowest quantity for
ignition.

H
I
K
L
M
N
O
P
Q
R
S
T
V
W

26/7/49

Block Time . Frequency

5.53 50.04

5.33 50.04

5.56 50.04

10.46 50.04

10.49 50.04

10.37 50.04

I
K
L
M
Mc
N
O
P
Q
R
S
T
V
W
Y

27/7/49
Smoking ~~is~~ Strictly
Prohibited

No unauthorized Person
Allowed

3/8/49

Collect Syphon from
Machinery for Acid
Drums.

Test Acid Drums
with 15 ^{lbs} ~~kg~~ ^{Per A¹} if
possible.

For Trials Shockiness

16	Litres	Methanol
16	"	Kerosene
44	lbs	Methanol

Four containers with
4 Gallons in each
patched 2/8/49

2/8/49
Taking Cine Photo of
Spill Vent of Servo's
with water in H.P. Vessel
& Pressure 17.0 ^{or} Kg/cm² 15.0 ^{inlet} Kg/cm²

3/8/49

Probably taking Cine of
Bleed with Paper off

Also measuring Volume
of Liquid after small
amount of Pressure on,
& with the 17 & 15 Kg/cm²
respectively

by blowing back Liquid
through Injector & out
of Spill Vent

I
K
L
M
N
O
P
Q
R
S
T
V
W
X
Y

8/8/49

Firing to test
Servo Valves with
water

Pressure on both
Vessels 15.0 K/g/cm

Cine film taken
showing that
Acid Valve shutting
off first

9/8/49

Drum No W.A 12140

Tested with 15.0 lbs \square "
^{Nitrogen}
found leak at weld
of end of Drum

Drums No W.A. 12141

12142 Leaky

12143

12144

Tested & found O.K.

No W.A 12141,

18/8/49

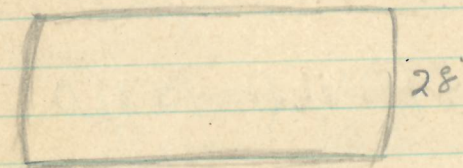
was used for Blending
Kerosene treated with
abused Acid.

washed out with hot-
water Two or three

(finally washed out) times
with Acid HNO_3

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3' 8"



Aluminium Drums
Capacity 98 Gallons

1/2 Gall Methanol
For Dr Gerty

198	152	62	16
	4		4
<u>795</u>	<u>104</u>		<u>64</u>

Making of D. 20

Weighing 800 lbs

H.N.O₃ 74.2%

HNO ₃	620 lbs	6 1/2 oz
Nitro Benzene	179	9 1/2

800 lbs 0 oz

Weighing	HNO ₃	154 lbs	1 1/2 oz
Batch	Nitro Benzene	44	14

26/8/49

Air Pressure Test -
12 lbs ^{sq} on Acid H.P.V
between outer casing
& Aluminium liner.
Vessel filled with water
& ruffle forced to one
of the Bolt Holes for
applying Air

Found to be O.K
no leak in Al. Liner

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28/8/49

Take Top off Acid
H P Vessel for inspection

To Convert - 4912 lbs \square
30.116 Reading X \uparrow = 14.973
~~15.58~~

WA 11327

Yeddington Value

C Rate 5.18.1

Fitzgerald 5.8.7

29/8/49

Sample taken after
Agitation of N/A No. 1 Room
(which is in Egg)

Mon. 29/8/49

An inspection of
Aluminum liner of Acid H.P.V
by Mr. Verschoyle Mr. Bancroft
Mr. Ross from A.P.V &
Another. (Passed as no leaks)

Convinced there is no leak
The cracks ~~were~~ ^{clearly} seen by at
the welding, ^{are} were due to
Stress when Vessel.

The cracks clearly seen
at weld are due to stress
of liner when vessel is
pressurized, & stretched
the weld metal which
is hammered when
cold.

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Tue. 30/8/49

Allen fitting Top
on Acid H.P.V. + removing
No. 11 Valve re-fitting Repaired
one in Position Pressure tested
to 60 kg/cm² + found O.K

wed 31/8

Acid Drain Valve on Cradle
removed owing to Leak
New Piece of Pipe to be
welded on.

Visit - Dr. Johnson

9.0 am Thurs 1/9/49

Pressure Gauges
to be covered
on Proof Stand

(Petroleum Spirit)
100 P.N

Mon. 26th Sept

Connected Acid Check
Valve also Acid Servo Valve
Pressure tested Proved
Servo Valve to be O.K, but
Check Valve letting by taken
down for inspection +
found to be leaking by
Brush seat - from Brush
being made.

27/9/49

New Emeter Ring + Nut
on feed Pipe from Reserve
Tank to No 11 Valve.

New Brush made for
Check Valve for Body Part
of Valve from No Pd-2 to
Bore + Spindle of Valve of
from Pd-No 1 for Pd-No 1

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Jobs for next week. (12/10/49)
W.E. 22/10/49

Alteration of lights
in Acid Bunker.

Get as many spare
Pipes & connections
as possible.

Get Outside Speaker
for Pit No 1 in
working order

Pressure Rig ^(being organized)
for Pit No 1 ^{by Jack}
(For calibration) ^{Braddock}

Dr Young has an
experiment to do
in Pit No 1

Take over one of
the Bobbing ^{to}
From Servo V ^{at Bancroft}
acid ^{bone}

14/10/49

No 1 Drum of Nitric Acid
being sent over to
South Side

Ask Dr Young where
he needs the Respiration
Bosers Put in
Bay 2

17/10/49

Acid Servo Valve
Removed & New $\frac{3}{4}$ " Ormeto
Body welded to
inlet of Valve to connection
to $\frac{3}{4}$ " Pipe, also bottom
fitted with Fluon ~~seal~~
washer bone.

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18/10/49

Explosion in Pit No 1
19/10/49 approx 11.30 am

Valve taken off ^{R.T} owing to leak

Repaired Valve fitted
on Acid Reserve Tank +
some Acid Pipe joints
(Fluon Seal) Renewed.

Acid Flow Pipe L. 11

- " - " L. 12

- " - " Service Valve

25/10/49

Observation Glasses
in Command Room
for Pit No 1 been
removed + silica gel
Baked + fitted again.

$\frac{3}{4}$ Mild Coupling

$\frac{1}{2}$ " "

$\frac{1}{4}$ " "

$\frac{3}{4}$ Non-Return Valves

$\frac{1}{2}$ " "

$\frac{2}{4}$ " "

$\frac{3}{8}$ - $\frac{1}{4}$ Stainless $\frac{1}{4}$ Coupling, $\frac{1}{4}$ Elbows

$\frac{3}{8}$ - $\frac{1}{4}$ Mild Steel

$\frac{1}{8}$ Stainless S. Coupling

" Tees

" Elbows

" Tees Mild Steel

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26/10/49

Clearing up of Bay 3
West end for Otto Smith
Glass Racks. Also the
Clearing of Proof Stand
High Vacuum Pump &
Rotary Pump.

Ten Venturi's been
Drilled for thermo couples
& lettered.

27/10/49

47 Revers to Lower
gates

58 Revers to Raise
Pole Gates

27/10/49

40.00 gm Reading
in Fuel Vessel
Petrol

28/10/49

R.A.F.

Farnborough
HANTS

R.P.D Westcott

Recorder Charts

No 1 Recorder 133 Chap

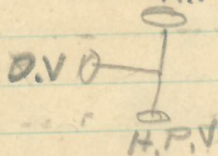
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8/11/49

60 litres of HNO_3
15 ft of $\frac{1}{2}$ Stainless Steel Tube
15 " " $\frac{3}{8}$ " " " "
3 ft of Polythene Tube $\frac{1}{2}$
1 " " " " $\frac{3}{8}$

+ Tested 3000 lbs Gauge
(Fred Halstead dispatched 8/11/49)

8/11/49
New Tree connected



New Ermeto coupling
connected in line

11/11/49

Chief Scientist is to
visit L.P. Group
atton, 5/12/49

Take off the Tops of
Acid + Fuel Servo Valves +
measure the distance
of traverse of each
Bobbin.

15/11/49
the brake screw on
thrust line has been
opened two turns
before H.R. # 512

15/11/49
Westcott Valve E Taken off
for inspection, Stainless
Steel wire disappeared
allowing cone to backle
& Reduce flow of HNO_3

16/11/49
Another Westcott Valve modified
& fixed in place of V.E

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21/11/49

Leak at Stud Coupling
Ermeto end. had to take
Piece of ^{Pipe} off to connect
new Ring. also evacuated
thrust liner & filled with
60/40 Glycerole by Volume
1.9 Water 1.0 Glycerine.
22/11/49

Pressure tested & after
tightening V. 12. Packing
Gland Water found
to be O.K.

Length of $\frac{3}{4}$ Pipe
taken out & the
weld cut out & an
Ermeto straight coupling
installed.

held Blocking up Bore
to about $\frac{1}{4}$ inch.

Amount of Petrol Grade 100
used in the
Rungs. 33 Runs

From No
To No

Diameter of Aviation
Fuel Grade 43

inside diameter 56.5 cm
Depth Liquid 50.6 cm
inside length 88.5 cm

Me
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Routine checks

24/11/49

Calibrate Gauges ✓

Check Alignment
of Thrust Block Motor axis
lever arm & wires

Labyrinth

waste to burning ground

fit flexible tube
for calibrating pressure

Send Acid Train ✓
over South Side

check amount
of Aviation Petrol
Used (Grade 100)

check Ermetor couplings

25/11/49

one drum with
unbroken seal (Petrol Grade 73
& one with seal broken
but none used from it -
Petrol 19. 73

also one empty
to be weighed by Stores

14 of containers of
absolute alcohol & one
empty. to be weighed.

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~~Two~~

wed. 7/12/49

Acid Servo Valve
taken off owing to bad
leak at end of Run for
inspection) Spring found
to be eroded Partly away
an old S.S one replaced
and tested & found O.K

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36.80
 32.70
 ———
 4.10

Furfuryl Alcohol		80 Gall
Kerosene		40 "
Methanol		80 "
Aniline		40 "
Petrol	Grade 80%	100 "
"	" 100%	50 "
Octane		12 "
Kerosene	Treated Mercad. H.	100 "
Absolute Alcohol		160 "
Nitro Benzene	Boamed. Vol. 10 Yare barbing	
Methanol	EX Ranakall	1 "
Ethanol		1 "

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~~Heath~~ Heath Leonard
26 Gladstone Road
Buckhurst Hill Essex,

Skinner Frederick George
8 Backway
Waltham Abbey Essex,

Hellstar George Thomas William
1 Southfield Road
Waltham Cross.

Park Edward Percy
18 Rounton Road
Waltham Abbey Essex

Saunders Thomas James
69 Eden bridge Road
Bush Hill Park Enfield.

Shinkin John
Glen Gids New Road
Waltham Abbey.

Fitzgerald Joseph
117 Bury Street
Edmonton N.9

Parker Bernard Arthur Ernest
30 Beechfield Walk
Waltham Abbey Essex

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How No.		Old No.
	<u>L.P.</u>	
570	Heath, L.	230
571	Skinner, F.C.	510
572	Taylor, F.H.	513
573	Skinner, A.A.R.	517
574	Clements, D.E.	519
575	Willshier, G.T.W.	530
576	Park, E.P.	551
577	Saunders, T.J.	555
578	Smith, W.H.	560
579	Huttlestone, H.A.	568
580	Shinkins J.	213
581	Smith, T.	
582	Gray, P.W.	508
583	Barnard, J.	240
584	Fitzgerald, J.	259
585	Adams H.A.	458

P
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30/11/49

Leak at Gland of V 12
Gland Nut tightened, also
ermeto Nut on top of Charlton
Valve + Slight leak at
Seal of Vessel Tightened
+ Pressure test - then
found O.K

Q
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Mon. Oct- 10th

Routine checks
Proof Stand

Attend to No 3 Recorder
also intercom ^(done) outside
Speakers

Repack Gland
Valve 1 fuel
Nitrogen (done)

No 10 Westcott Valve
Taken down for Repair
owing to leakage, ~~it~~
Replaced by Spare.
Repaired one.

11/10/49

Goan	2.30
Barker	2.35
Paine	2.40
Fowler	2.45
Rumble	2.50
Ayson	2.55

5/10/49

Two containers of
HNO₃ (a) C. Sample
collected for
Major Ferguson.

1
Frost - turning 100 lbs
17 April 1947 Water
~~20/3/48~~

25/3/48 500 lbs

Jewellers Saw

Skinner ✓ Suit & Shirt

Smith ✓ -

Saunders ✓ Pair Socks

28/9/49

Uncover Portable
ignition Stand
H.16

also tarpaulin from
Accumulators

Put Electric Starter
into east end of
Bay 4 berditi Section

Clear up Soffer Pipe
from Bay 6 into
Bay 3.

Get 20₂ Chain for Bay
east end.

Air Pressure Test 12 lbs [□]
on Acid H.P.V by means
of Vessel filled with water
with top off + nipple fixed
in place opposite of the
~~cap~~ inspection

Air Pressure Test 12 lbs [□]
on Acid H.P.V with top
off + filled with water
+ nipple fixed at one
of inspection Bolt Holes

between outer casing
& Aluminium inner lining

Venture A.46

Smith L 560

Heath L 230

Smith T 581

Hollands L 653 (Taken)

Powell J 829 Received this
morning
9/8/49

Key No H.16 (3A976)

Gravener 229

Surgory 219

Shunkens }
Taylor } $\frac{5}{12}$ overtime

Readings of Barometer
105
.002

Wellster L 580
3 For W.E 9/7/49

Pittlake Pressure Vessel
(4314)

(Carbon - Tetrachloride)

Avo meter
W.A. 5301

Jam Jars 2 lbs.
if possible

L.1. 5. 10. 8

L.2. 5 8 " 7

Saroul

Attend at Short Office
Monday Afternoon
3.0 P.M.
Birth Certificate
2/6

Two Cart of
Furfuryl Alcohol for
EADG

Taylor	Y	WE	3/7/48
Gray	P	"	10/7/48
Hillier	G	"	17/7/48
Park	E	"	8/1/49
Heath	L	"	15/1/49
Smith	W	"	22/1/49

Stainless Steel
Mesh for filter in Fuel
line

1000 Stand + 200 Salary + 1000

NAMES	GDE	No	New No	1/10/49
Shenkins	J	B.	213	580
Heath	L	B.	230	570
Barnard	J	B.	240	583
Fitzgerald	J	L.2.	259	584
Adams	A	C.	458	585
Gray	P	B.	508	582
Skinner	F	B.	510	571
Taylor	F	B.	513	572
Skinner	A	B.	517	573
Clements	E	B.	519	574
Hillier	G	B.	530	575
Park	E	B.	551	576
Smith	W	B. Special	560	578
Huttlstone	H	C	568	579
Smith	Y	B	581	581
Saunders	J	B.	555	577
Blaker	J	B.	202	
Fitters				<u>Fitters Mate</u>
Gossett	F	418		Ganghan P 634
Woodhams	S	843		Parker B 428
Hardy	Y	814		

<u>Electricians</u>		<u>Electrician's Mate</u>	
Austin	L 833	Hardiman	A 132
Powell	J 829	Hollands	E 653

9. 4. 11