OCCASION

This publication has been made available to the public on the occasion of the 50th anniversary of the United Nations Industrial Development Organisation.

DISCLAIMER

FAIR USE POLICY

CONTACT

Please contact publications@unido.org for further information concerning UNIDO publications.

For more information about UNIDO, please visit us at www.unido.org

UNITED NATIONS INDUSTRIAL DEVELOPMENT ORGANIZATION
Vienna International Centre, P.O. Box 300, 1400 Vienna, Austria
Tel: (+43-1) 26026-0 · www.unido.org · unido@unido.org

D01740

Distr.
GENERAL

ID/CONF.1/B.6*
8 June 1967

United Nations Industrial Development Organization

ORIGINAL: ENGLISH

INTERNATIONAL SYMPOSIUM ON
INDUSTRIAL DEVELOPMENT
Athens, 29 November-
20 December 1967
Provisional agenda, Item 3(a)

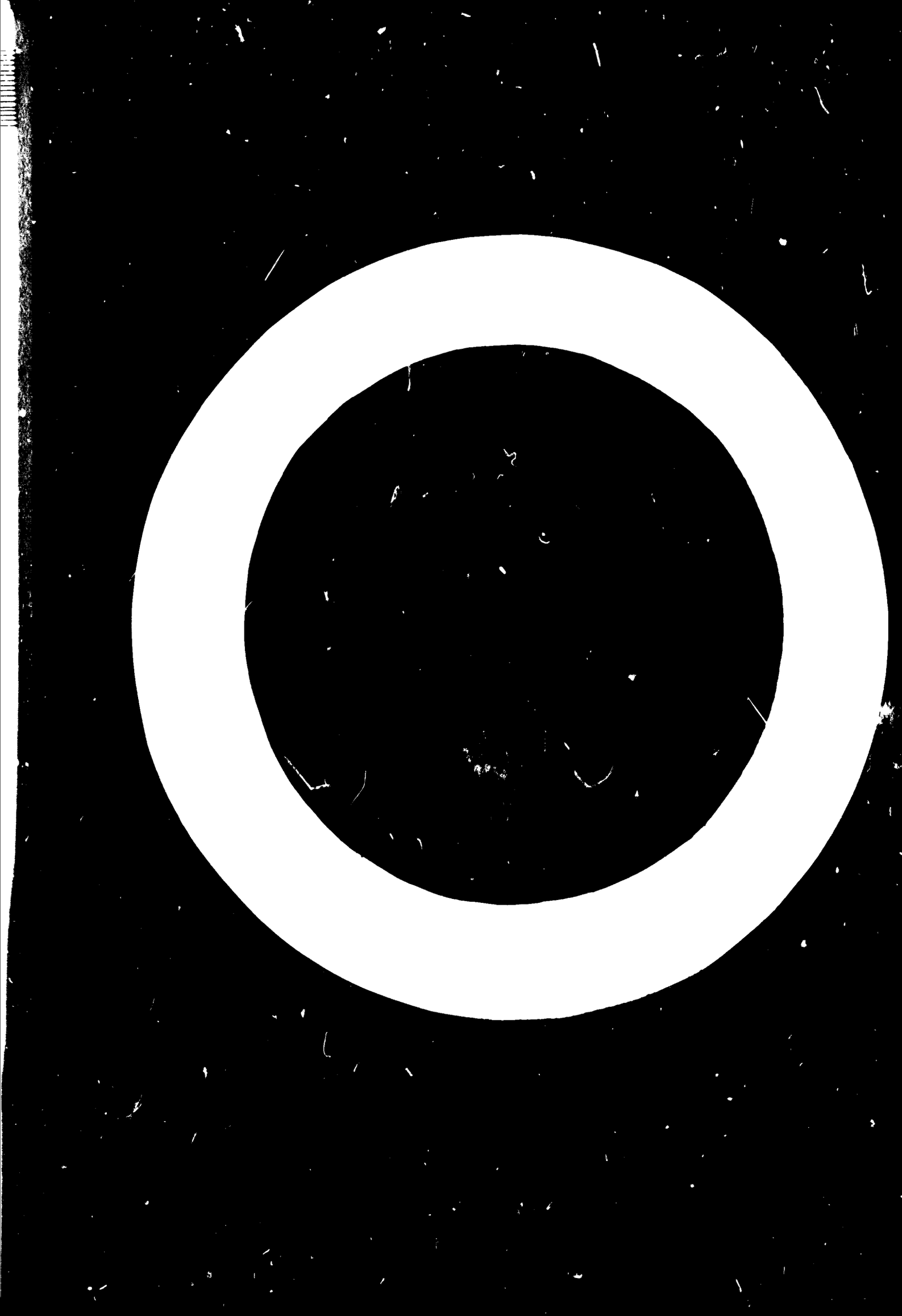
PLANNING FOR INDUSTRIAL SAFETY AND HEALTH IN THE PLACE OF WORK

Prepared for the Symposium

Presented by the International Labour Office

---

* A summary of this paper may be found in document ID/CONF.1/35



CONTENTS

	Paragraphs
INTRODUCTION	1 - 6
I. ELEMENTARY MEASURES	7 - 24
Site	7
Water supply	8
Fire protection	9 - 10
Natural ventilation	11 - 12
Temperature control	13 - 15
Lighting and colour	16 - 19
Construction materials	20
Layout	21 - 22
Housekeeping and cleanliness	23 - 24
II. ADVANCE AND LARGE-SCALE MEASURES	25 - 26
Pollution	27 - 29
Traffic	30
Community resources	31
Security	32 - 33
Toxics, flammables and explosives	34 - 36
In-plant traffic	37 - 42
Lighting	43 - 44
Utilities and services	45 - 46
Ventilation	47 - 50
Temperature and humidity	51 - 53
Noise	54
Explosion and fire	55
III. CONCLUSIONS	56 - 58

INTRODUCTION

1. The principles of safety and health planning based on existing resources and needs within the developing country must be adaptable to large industries, medium and small industries, artisan workshops, and rural undertakings. The latter two represent the great majority of workers in almost all developing countries, but the principles cited in this paper must also suit the whole range of industrial undertakings.

2. Productivity may be defined as the ratio between output and input. For any given industrial establishment, the resources available for input may be listed as follows: (a) Land and buildings; (b) Materials; (c) Machines; (d) Personnel.

3. The manipulation of these resources to produce goods and services determines the productivity.

4. To emphasize the importance of safety and health and their effects on the resources, consideration of their interdependence is necessary. Safety and health requirements satisfied in the selection and use of land, buildings, materials, and machines will add to the effectiveness of human services. Conversely, neglect of safety and health considerations will unfavourably affect human services, so that machines, materials, and other resources are ineffectively utilized to the detriment of productivity. The loss may be multiplied by poor planning of safety and health with two or more other resources. For example, a hazardous material may be handled without proper precautions and utilized on an unsafe machine. Workmen are not only subjected to hazardous material exposure but also to the hazards of the machine. As the risks multiply from neglect of safety and health planning, the accident and disease rates increase. The total effect may be so harmful to productivity that the achievement of industrialization is delayed for many years.

5. It may be pointed out that planning for safety and health is a preventive measure which costs nothing or very little when only elementary measures are included. The effect, however, may be colossal where these elementary measures raise the workers' general level of safety and health. A little prevention may increase productivity, carrying health measures into the community, reduce the economic burden of industrial diseases transferred to the community as when a worker is unemployed due to illness, and raise the general socio-economic level of the population.

6. This paper deals with planning safety and health in the workplace mainly prior to construction. It is in two parts: the first discusses safety and health principles which may be applied in planning at little or no cost - elementary measures. The second part deals with more advanced safety and health planning that will be practicable where suitable conditions exist.

I. ELEMENTARY MEASURES

Site

7. The selection of a proper site for a workplace is becoming increasingly important for both industry and communities. Some countries require approval of sites by the competent authority whenever the environment may be endangered. Many factors may be considered which will promote safety and health just through the proper choice of a site. The community may be concerned with future industrial health and safety problems, while the industry will be interested in the resources offered by the community to meet future industrial health and safety requirements.

Water supply

8. Depending on the degree of community development, simple matters such as a safe and adequate water supply may need attention. Mention of potable water for industrial use may seem unnecessary, but in many areas of the world the supply problem must be considered. Sanitation, whether in a new industry or outside it, is hard to imagine without the availability of a suitable water supply. In planning for the use of industrial water, selection of a wholesome source is essential to the maintenance of healthful conditions of the workplace. Also, process water used during production can have a direct influence on the health of product consumers. A most interesting experience was recently publicized concerning plastic objects containing water which were used in drinks as ice cubes when frozen. The water in these novelty ice cubes was found to contain microbiological flora of human waste necessitating their removal from the market.

Fire protection

9. An adequate water supply should be considered in connexion with fire protection. The simple planning of a water source and method of its application

will provide the basis of fire protection. Planning for water suppply and fire protection has saved many industrial establishments from the flames.

10. Fire protection can also be planned at little cost by considering the siting of a new factory where air currents may endanger it by acting as a fire hazard. Upwind ignition sources should be observed before the factory sites its storeplaces for flammable substances. The converse must be considered if the factory may act as an ignition source for flammable materials drifting downwind.

Natural ventilation

11. Air resources may also be utilized in planning to benefit safety and health at the workplace in another manner. The use of natural ventilation is free, but it must be planned prior to construction if the full benefit is to be obtained. The effect of natural winds in cooling and ventilating the workplace can be utilized provided that building siting and construction allow free wind flow. In general, from a health standpoint it may make more sense to open up the walls of a building to allow natural dilution of hazardous materials than to close them to increase air concentrations. If it is necessary to have workmen in areas of natural ventilation where toxic materials are processed and give rise to air contaminants, it may be practicable to enclose the equipment so as to have clean and comfortable air. The economics will of course depend on the number of work stations to be dealt with.

12. Comfort of workers under physical stress in a hot environment may be enhanced by utilizing the cooling effects of natural ventilation. Simply by elimination of walls or addition of windows, the planner may allow for the escape of heat which might otherwise cause an unhealthy condition. When considering the effects of heat, the health standpoint is not the only one. Correlation between heat stress and productivity shows the high cost of production when workers must operate under heat stress.

Temperature control

13. In addition to natural ventilation the use of barriers between the heat source and workmen is important. Consideration of the solar heat load, especially in tropical climates, points to the importance of the commonest heat barrier - the roof. Utilizing natural ventilation in conjunction with a properly designed roof will go a long way toward reducing heat stress at little cost. Insulated monitor roofs may reduce the solar load four times as much as other roof types.

14. The siting of hot equipment (furnaces, boilers, etc.) must take account of the positions of operating personnel. Hot equipment should not surround personnel or be underneath their work stations, since heat effects would thereby become multiplied. Planning the workplace so that thermal barriers provide screening between very hot equipment and work areas may be as simple as changing the position of equipment.
15. In the more northern climates the effects of cold must also be considered in the workplace design. Loss of efficiency and dexterity, and increased susceptibility to disease afflict the worker in a cold environment. The large number of industrial accidents attributed to numbness make temperature control for cold areas very important for industrial productivity. Temperature control for cold areas need not be considered hopeless or over-costly with the use of modern radiant heaters.

Lighting and colour

16. Lighting design is mainly aimed at providing the right quantity of light at the proper place to enable efficient accomplishment of visual tasks. Both artificial and natural lighting may be included in the design. Accidents due to poor lighting have been estimated at 15 to 25 per cent of all industrial accidents. Dangerous areas and operations must be illuminated sufficiently without sharp gradations of brightness. Lighting design should take account of brightness levels of the background and the work, since the eye tends to drift to bright areas. Lighting standards are available from illuminating engineers and should be followed for effective design. Effects of roof and window light must be anticipated to avoid glare. Diffusion of incoming light, tinted glass, and reflective glass may all be useful in reducing and distributing light that may act as a visual distraction.
17. It is essential to study the object or area to be lighted before deciding what and how much lighting is needed. Surface configuration, colours, background, detail of work, speed of perception, contrasts, visual acuity, glare and other essentials must be taken into account in the lighting design. Colour utilized properly within the factory can enhance the effects of lighting. Light-reflecting qualities of surfaces may be considered in lighting design to improve visibility. Colours may provide pleasant backgrounds providing necessary visual rest areas. The psychological effect of colours cannot be ignored in decoration schemes. Colour coding of all plant hazards is essential as a safety measure. Standards of colour coding are readily available in most countries.

18. The use of colour is not intended to replace good safety practices or mechanical guarding. Colour acts as a communication medium providing signals to the observer which should be easily understood. As signals, colours must mean the same to everyone concerned and should not be over-utilized to the extent that they are disregarded. Recent international colour recommendations include the following:

Colour	Meaning
Red	Stop, harmful activity
Yellow	Attention, danger
Green	Safety
Blue	Signalling colour for organization, instruction or information.

19. These colours are defined in terms of the standard colorimetric system and should be prepared accordingly to eliminate confusion. Initial painting with code colours which meets regulatory requirements will add to the over-all effectiveness of operations in any new industrial plant.

Construction materials

20. The use of colour and surfaces conducive to good lighting practice illustrate the importance of choosing the right construction materials. Choice of construction materials is dependent on cost, availability and other factors, but safety and health implications may be important enough to dictate the use of a specific material. Structural and interior materials are all related to health, comfort, and safety in the new workplace. Structural members must conform to loading, fire protection, and other design requirements for minimum safety. Floor materials should be considered in terms of load, noise conductivity, illumination, chemical reactions, and other factors. Walls and ceilings must also be considered in relation to their future use. For example, sanitary considerations may require a smooth impervious surface, but account must be taken of the resulting slipperiness and where necessary non-slip materials must be used.

Layout

21. After proper materials and equipment are chosen with due regard to safety and health, the placing of materials and equipment presents a problem which costs

nothing to solve apart from the time required to plan an efficient, safe and productive layout. Regardless of the size, economics or type of workplace, layout is important. From the view of the safety specialist, layout is an interrelation of the workplace size, process and machinery. Within the area allotted for production, machines may be placed so that the process will flow smoothly without a process jam. Disregard for human operators during layout usually results in an unsafe working environment even though the machines and processes appear to be properly located. The working motions and areas of work stations must also be provided for in the layout. Even if manual work is done and hand tools are used, these principles still apply. Overcrowding usually results in accidents simply because of the interactions between workmen, while isolation of workmen usually results in excessive materials handling. Particular attention should be paid to avoiding these two extremes. The handling of materials accounts for a majority of industrial accidents. Thus, minimization of material handling, and provision of adequate room for aisles, platforms, pipelines, conveyors and other working equipment will aid in the over-all safety programme. Areas of known hazards should be guarded, for instance, where different activities overlap.

22. The layout of a workplace may be determined by use of a flow diagram. The flow diagram may be a simple paper sketch or range up to a complete three-dimensional model. Whatever the requirements of the workplace, a flow diagram for developing the layout will solve safety and health. In brief, when positioning machines and processes within the work areas, do not forget the workmen.

Housekeeping and cleanliness

23. The best layout may be a failure if good housekeeping is not practised. Maintaining a workplace in a neat and orderly fashion is an essential requirement for high productivity and low accident rates. Passageways must be kept clear for experience shows workmen will go around objects rather than move them. This may nullify the planned layout and constitute an unsafe act which will lead to an accident. Accumulations of materials, equipment, tools, etc., in passageways and work areas can be avoided by good housekeeping. Maintaining everything in its place and keeping to safe work methods will lead to safe working conditions and a reduced accident rate. The benefits of good housekeeping and cleanliness far outweigh the small costs of practising it. An essential requirement for a healthy workplace is maintenance of sanitary conditions.

24. Handling of waste and refuse in a sanitary manner with subsequent cleaning of the workplace is necessary to avoid health risks. Control of rodents, insects, and other vermin will help to raise the general health level by eliminating disease carriers from the workplace. Minimum requirements of sanitation may be found in the ILO Model Code of Safety Regulations for Industrial Establishments (1949) and in Recommendation No. 97 on the Protection of Health in Places of Employment adopted by the International Labour Conference (1953).

II. ADVANCE AND LARGE-SCALE MEASURES

25. In more highly industrialized countries the rising costs of construction, prefabrication methods, emphasis on automation, and fast-changing process technology necessitate considerable pre-construction planning to ensure construction of an economically efficient industrial plant, and this applies to all levels of industrial construction from the very largest to the smallest individual unit.

26. In comparison with other problems confronting the design team, it can be said that safety and health problems often take second place. Experience has shown that most of them are only thought of as accessory to problems of production, layout and environmental control. However, disregard of safety and health aspects of production and operation would soon be seen to be uneconomic as well as unsocial. It is the purpose of this section to emphasize some of the more advanced techniques of safety and health so they are readily available for reference and not forgotten in the planning process.

Pollution

27. Industries in developed countries are experiencing increasing pressure on questions concerning future air and water pollution from communities considered as site locations. Fears of these communities are not without justification in view of past industrial-community experiences which are so well reported and documented by the news media. No community wishes to be a partner in an operation which turns clean water and air into health hazards and eyesores for its citizens. On the other hand, some industries cannot claim complete control over effluents and emissions to maintain water and air unaffected. Environmental consultation and planning between both parties, including proper site selection, could control community health hazards presented by the construction of a new factory.

28. Air pollution is not the sole property of industry. The picture of an industrial stack emitting some visible pollutant is considered the sole source of air pollution by many uninformed people. True, this is a source, but only a share of all the air pollutants produced in a given community. Recognition of the industrial source when selecting a site will foster proper planning by the community in locating the industry within populated limits. The use of prevailing wind directions and buffer areas surrounding industrial developments should be considered during site selection. Factories are too often surrounded by dense community populations which sprung up as a result of industrial development in the areas or were located around the new factory site from the beginning. Drift of air pollutants including toxic gases, flammable vapours and offensive odours, naturally cause alarm over possible health implications. The site should be selected and maintained so that wind conditions and buffer zones allow the new industry a working environment that minimizes population health hazards.

29. Industrial waste effluents must also be reviewed with regard to the community surrounding the plant. Open sewers, streams and canals carrying toxic or obnoxious wastes through a neighbourhood acts as an invitation to the day when the new factory is blamed for the death of a child or domestic animal. Even enclosed waste disposal systems must be regarded with care if they carry flammable and explosive wastes.

Traffic

30. Traffic conditions surrounding the new factory site may be hazardous. It is not unknown to find a valuable workman amongst four tons of twisted steel just outside the factory gate after he has completed a safe working day. Large new factories create transportation problems as workers move to and from the workplace. The site may be located with traffic safety in mind and may be suitable for existing conditions or necessitate new road construction for safe traffic movement. Traffic patterns should be studied by those responsible for site selection so that arrangements can be agreed upon between the responsible traffic authority and the factory management.

Community resources

31. Resources within the community such as fire brigades, police, medical, hospitals, and safety and health experts should be considered in industrial

planning. The use of these resources during possible future industrial emergencies could mean the difference between life, death and the preservation and loss of property.

Security

32. The need for eliminating risks from outside the plant is shown by the large number of modern plants completely enclosed by fencing and guarded by watchmen. In cases where extremely dangerous materials such as radioactive materials are used, the use of fencing and security personnel is an essential part of the safety and health programme.

33. In some areas fencing may be regarded as noise barriers. Installation of solid fencing and proper positioning may be planned with both security and accoustical control in mind.

Toxics, flammables and explosives

34. The storage of toxics, flammables, and explosives must be separated from ignition sources and occupied work areas within the plant. In a good layout these storage areas will be downwind at the periphery of the plant. The release of the materials from spills and breakage would be a hazard which under favourable ignition conditions could destroy the entire plant. Wind conditions alone are not sufficient to control the spread of accidental spills. Topography must be considered so that the storage areas are not uphill from congested working areas and ignition sources. Even remote storage on flat ground can present a problem of possible contamination by percolation of the spilled material into the soil and ground water. Eventual run-off of hazardous substances may contaminate nearby streams, lakes and ponds or create either an explosive or a toxic hazard in areas surrounding the plant. Just a few years ago, the spillage of thousands of gallons from an oil storage area ran off into a large midwestern United States river. Planning of storage areas should include preparations for dykes, impervious foundations and holding tanks to contain accidentally spilled volumes of hazardous materials.

35. Many industries utilize railroad tank cars for the movement of raw materials into the plant and finished products leaving the plant. Remote locations within the plant property are desirable for railroad tankage spurs. Unloading and loading systems can be designed so that a minimum of material handling and contact is

required of the workmen. Remote control houses for highly toxic materials can be used where the presence of a workman is only necessary for tank car attachment and detachment.

36. Storage areas for hazardous agents must be designed for specific types of materials. In the case of explosives, electric lighting that is not flameproof should not be used in any storehouse. Where the explosion risk warrants additional protection for nearby areas, earthen or concrete barriers may be utilized to enclose the hazardous storage site. Protection of explosive storehouses from the elements is essential as risks from detonating sources such as lighting must be controlled.

In-plant traffic

37. The design of roads and walkways within factory boundaries is mainly a matter for the designer who, in many cases, is not bound to comply with safe design requirements for public roadways and walks. Layout of traffic ways must be governed by the plant operations. However, safety considerations should be respected in the layout. Access to all operational units must be provided for fire-fighting purposes. Roadways on two opposite sides of a unit are usually sufficient, allowing access even in the event of a road blockage. Roadways act as fire gaps between operations and must also be designed for personnel evacuation during emergencies.

38. In-plant road crossings should be limited or eliminated if possible. In addition to reducing the risk of collisions, limitation of crossings will prove economical because of the increased speed of transportation. In many cases roads may be designed to eliminate collisions involving damage to operating units.

39. The provision of adequate turn-around space near congested areas will aid in reducing the frequency of accidents due to vehicles reversing.

40. The movements of goods and materials between plant operations can be designed so that bottlenecks, congested areas, and narrow road widths are avoided. Many places must be adapted to the type of vehicular traffic that is expected. For instance, overhead high-voltage lines have no justification in traffic areas where boom vehicles and dump-trucks must operate.

41. Roads are usually thought of as always being passable. However, changes in weather must be considered in connexion with accessibility and visibility. Weather conditions have made many remote areas inaccessible for emergency vehicles. Good drainage and grading will prove profitable during times when roads are under ice,

rain or snow. Visibility becomes important if a plant remains operational during the night. The design of road lighting and signals should be such as to provide adequate light at all places where lack of visibility would be dangerous.

42. Pedestrian traffic must be catered for in road design as the mass influx and exit of workmen during shift changeovers would present uncontrollable hazards if no special pedestrian trafficways were provided. Traffic controls such as signals and roadway painting help to ensure safe traffic conditions in the new plant.

Lighting

43. Exterior lighting has already been mentioned for roads, but it also must be included as a general safety requirement.

44. The layout of units should be designed with optimum lighting. The layout of buildings and operational units may block natural and artificial lighting if proper care is not taken.

Utilities and services

45. Electricity, water, gas, steam, waste disposal and other services installed and maintained in conformity with safety and health regulations will ensure safe working conditions in the new plant. Accidents tend to occur more frequently when the original design of some equipment is changed or it is used for purposes other than that for which it was intended. Utilities that are designed and installed in conformity with safety standards should be a feature of the general safety programme of the new plant.

46. Good layout of piping, electrical lines, water and sewage lines and other service lines should eliminate some of the unsafe and costly features found in poorly designed plants.

Ventilation

47. Mechanical ventilation is preferred to natural forces because of its controllability. Harmful (toxic) gases, vapours, smoke, and dusts present special problems of control which mechanical ventilation must handle. Risks of fire, explosion and health impairment should be considered in the factory design stage so that effective mechanical ventilation control can be provided. Crash programmes of ventilation to control hazards discovered after a plant has started production are never fully efficient and economical.

48. Mechanical ventilation designed for hazard control may be local for exhausting or general for dilution.

49. As materials become more dangerous, more reliance is placed on effective exhaust systems. Consideration must be given to toxicology, physiology, aerosol physics and other specialized sciences when designing an effective control system for airborne hazardous materials. The work area should be designed so that effective ventilation limits or inhibits the contact of these materials with workmen. Often quoted is the example of a perfectly designed ventilation and exhaust system which diluted a toxic material to well below dangerous concentrations, but removed the air through the workers' breathing zone.

50. Mechanical ventilation may also add environmental problems on the plant. Ducts must be positioned so as not to block good lighting or obstruct a necessary field of vision, such as that required for an overhead crane. The fans, blowers, compressors, and other ventilating equipment will raise plant noise levels. Thus, proper positioning of ventilation equipment is important; and so is maintenance. Arrangements must be made so that safe maintenance is ensured. Proper ventilation is so important to health and safety that all ventilation plans should be submitted to an engineer competent to deal with safety and health aspects.

Temperature and humidity

51. The control of environmental temperature and humidity poses difficult problems to plant designers.

52. The psychrometric chart is useful for home design and simple plants where supply-air conditions can be estimated and controlled. As the scale of hot processes increases in a plant, temperature and humidity conditions become more difficult to calculate. Design must effectively utilize known variables of temperature and humidity within the proposed plant so that work efficiency is not impaired by these factors. Heat may be exchanged through conduction, convection, radiation and evaporation. All these methods of exchange must be considered for inclusion in the new plant design if the workers will be liable to suffer from heat. Review of all sources and sinks of heat surrounding a work station may well show the uselessness of a ventilation system for cooling the workmen.

53. Temperature gradients may vitiate a ventilation design by creating pressure and flow differences between work areas. Study of air-flow patterns produced by pressure and temperature differentials will frequently reveal undue exposure of workmen in adjacent rooms. Ventilation pressures should be guided to areas where containment of hazardous materials is required.

Noise

54. Industrial noise has recently been given more attention in plants. Noise production can be controlled in the design stage but in existing facilities only noise reduction programmes are possible. Noise is important as it irritates, interferes with oral communication, induces fatigue, reduces production and causes occupational deafness. Reducing in-plant noise to an acceptable level is the next best thing to controlling noise in production. Noise may be regarded from three angles: source, transmission path, and receiver. The design of a new plant must take account of all three angles and apply known remedies such as distance, mufflers, enclosures, absorptive materials, isolation, and damping materials when noisy equipment or processes have to be provided for. A good accoustician will be needed to control noise effectively in a new plant. However, a great deal of the machinery purchased for operative processes will omit noise which is beyond the control of the accoustician. Hence, when purchasing, if a choice of equipment is possible, noise levels should be compared.

Explosion and fire

55. The control of explosive atmospheres containing dusts, flammable gases or vapours necessitates special design requirements to ensure effective fire prevention and protection. Explosion and fire protection must form an integral part of the new plant design if the hazards are to be controlled. Explosion protection is only a special part of the over-all fire protection which should be planned by experts because of the complexity of the design problems.

III. CONCLUSIONS

56. There is a tendency to neglect occupational safety and health in industrialization, and, in many countries there is a very great shortage of the medical and technical personnel and scientific equipment required to ensure the health and well-being of the labour force.

57. Hence, improvements in this field require sustained efforts with a view to:

(a) Recognizing the problems and determining their significance;

(b) Arousing the interest of all parties concerned;

(c) Devising practical methods to improve conditions;

(d) Planning local, regional, national or international action to apply these methods.

58. Action by the International Labour Organisation could take any of the following forms:

(a) Placing at the disposal of developing countries, perhaps by regional arrangements, teams of experts and, later on, technical and scientific equipment;

(b) Technical meetings and courses for key personnel with various technical backgrounds;

(c) Development of appropriate training schemes;

(d) Provision of technical advice and services for individual undertakings according to particular needs;

(e) After sufficient preparation, assistance in the establishment of the required national services or institutes through Special Fund contributions.

D01740

Distr.
GENERAL

ID/CONF.1/35*
5 June 1967

United Nations Industrial Development Organization

ORIGINAL: ENGLISH

INTERNATIONAL SYMPOSIUM ON INDUSTRIAL DEVELOPMENT
Athens, 29 November-20 December 1967
Provisional agenda, item 3 (a)

PLANNING FOR INDUSTRIAL SAFETY AND HEALTH IN THE PLACE OF WORK

Summary

Presented by the International Labour Office

1. Considerations of safety and health prior to the construction of the place of work are outlined in this paper. Good planning in relation to improvement of productivity necessitates minimum levels of attainment of safety and health. Basic factors such as site selection, water supply, fire protection, natural ventilation, temperature control, lighting and colour, construction materials, layout, cleanliness, may be considered as elementary measures required for maintenance of workplace safety and health. These principles may be applied in workplace planning at little or no cost.

2. More advanced measures are also outlined in this paper. They may be applied wherever suitable conditions exist. Safe and healthy working conditions must be recognized as a prerequisite to sound industrial development. Planning for safe work presents an excellent opportunity to apply known preventive measures.

---

* This is a summary of a background paper issued, under the same title as ID/CONF.1/B.6.

67-12883

10. 6. 71