CHAPTER - 1

Personnel

1.0 Introduction

It is accepted beyond doubt that manufacturing quality medicines and making them available to mankind is not only a physical activity of processing materials using equipment in a facility. The main resource in manufacturing and distributing quality medicines is the people behind all these activities that are carried out in a pharmaceutical factory. All the regulatory requirements throughout the world talk about handling the pharmaceutical process by trained people. Trained people are those who have the knowledge, skill and attitude, which is appropriate and positive. W.H.O. guidelines on Good Manufacturing Practices (G.M.P.) very appropriately mention this in operating remark about personnel – it says, "The establishment and maintenance of a satisfactory system of quality assurance and the correct manufacture and control of pharmaceutical products and active ingredients rely upon people." It further states, "For this reason there must be sufficient qualified personnel to carry out all the tasks for which the manufacturer is responsible. Individual responsibilities should be clearly understood by the individual concerned and recorded as written descriptions. All personnel should be aware of GMP that affect them". Orange guide of M.H.R.A. further adds that "they must receive initial and continuing training including hygiene instructions relevant to their needs". M.C.C. South Africa GMP guidelines specifically states: "There should be sufficient personnel at all levels with the ability, training, experience and where necessary, the professional/ technical qualifications and managerial skills appropriate to the tasks assigned to them". Their duties and responsibilities should be clearly

explained to them and recorded as written job descriptions or by other suitable means".

If we try to analyze these comments by the international regulatory authorities, following things come out distinctly from this:

(i) Establishing and maintaining satisfactory quality assurance systems, manufacturing and control of pharmaceutical products, and active ingredients are the jobs of people.

(ii) The people who are responsible for these activities must be suitably qualified, trained and experienced. These people should have the ability to shoulder the given responsibility.

(iii) The number of people should be sufficient to carry out the activities in the plant.

(iv) All people must be clearly told about their jobs, till they understand and perform accordingly. Their job descriptions must be written down and handed over to them.

(v) All people must be trained in GMP relevant to their activities and personal hygiene practices.

(vi) Where necessary people should have professional, technical and managerial qualifications, training and experience to carry out their prescribed duties.

Above is a brief requirement about the people in general. In addition to this the guidelines talk about certain other general requirements and certain specific issues. They are as follows:

(i) Responsibilities of key personnel.

(ii) Training.

(iii) Legal aspects related to people.

(iv) Qualifications and experience of employees.

(v) Hygiene and personal hygiene practices and medical check-ups.

(vi) Clothing.

(vii) Steps should be taken to prevent unauthorized people entering production, storage and quality control areas. Personnel who do not work in these areas should not use them as passage way.

We shall now see all these points in more detail in the following pages.

1.1 Qualifications and Experience

As we have seen in the earlier paragraphs all the people who are working in various activities in pharmaceutical manufacturing must have relevant qualifications and experience and they should be sufficient in number. We now see issues in more detail. First, let us see what the international guidelines say and then we try to understand the same in our scenario. W.H.O. GMP guidelines state the following points in this regard.

REGULATORY TEXT AND COMMENTS

(a) WHO Guidelines

(i) The manufacturer should have an adequate number of personnel with the necessary qualifications and practical experience. The responsibilities placed on any one individual should not be so extensive as to present any risk to quality (10.2).

Comments

This clause specifically talks about two things : (i) qualifications and experience of people working in the pharmaceutical organization; and (ii) sufficient number of people to work and discharge their duties. Now let us see about these two points in a little more detail.

Regulatory guidelines demand that the people responsible for carrying out pharmaceutical manufacturing and distribution activities should be appropriately qualified and have sufficient and relevant practical experience to understand this concept little more. We must ask ourselves two questions:

(i) What are the areas of specializations you require, and the specializations your people to have?

(ii) What are the levels at which these people will be working?

One can answer these questions as follows:

I need people in the following areas of specialization, e.g. Production, Q.C., Q.A., Engineering, Stores, personnel, finance, etc.

I need people in the following levels, e.g. workers, Supervisors, Executives, Managers, General Managers, Presidents, etc.

We first look at the academic qualification required in various areas of specialization:

- Production : B.Pharm; M. Pharm; Ph.D.
- Q.C./Q.A. : B.Pharm; M.Pharm; Ph.D., M.Sc., in microbiology, organic chemistry, analytical chemistry and M.Sc. in T.Q.M. Presently some postgraduate diplomas are also available in analytical and technical chemistry, which are also suitable.
- Engineering : Diploma in Engineering, B.E. M.E. in suitable areas like Civil, Electrical, Electronics, Mechanical, Chemical, Environmental engineering etc.
- Stores : Postgraduates in materials management or Postgraduate from Indian Institute of Materials Management etc.
- Personnel : M.B.A. (Personnel/H.R)
  P.G.Dip. in Trg. and Dev. (From Indian Society of Trg. and Dev.)
  M.S.W. in (Personnel Management and I.R.)
  M.H.R.D. etc.
- Finance : M.Com., M.B.A. (Finance), Chartered Accountants etc.

Additional qualifications in Management, Law, Quality Systems, etc. will be advantageous depending upon the level of the employee and his area of specialization.

Presently at the worker level a minimum qualification of 10^{th} or 12^{th} standard is considered. In many organizations Diploma in Pharmacy persons are employed as operators. However, 12^{th} std. and I.T.I. trained persons in suitable discipline are considered more suitable.

Now let us see what is the trend relating to experience. If we see the current scenario and compare it with the past, one distinct feature comes forward and that is, the relation between organizational positions and years of experience has changed substantially.

We definitely need to know as to what is the current scenario. It is like this:

Organization Position	**Years of Experience Required or Seen**	**Age of The Employee**
1. Supervision	Fresher	22 yrs.
2. Executive	3 to 5 years	25-28 years
3. Manager	8-10 years	30-32 yrs
4. General Manager	15 years	35 yrs
5. Vice-President	15-20 years	35 to 40 yrs.

The above is only a general observation however it can vary substantially in exceptional cases.

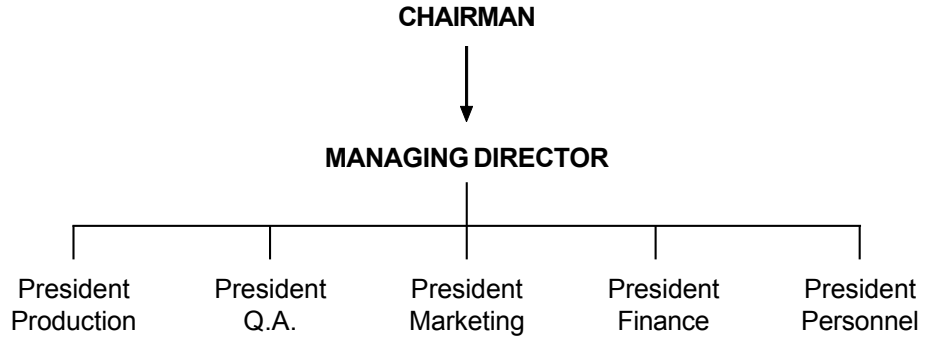
Whatever we have discussed is about the academic qualifications and experience. But the equally important aspect is the number of people. This is based on the volumes of activity the organization handles. Depending upon the volume, the number of people should be employed. The criterion is that a person should not be overloaded so that the quality of his work is not affected and it does not result in adversely affecting the quality of products being produced.

In this connection the F.D.A. auditors, ask to show the plant capacity details, the number of shifts the plant is working and the number of employees the organization has employed. There should be a reasonable co-relation between the employed people and the load of work handled.

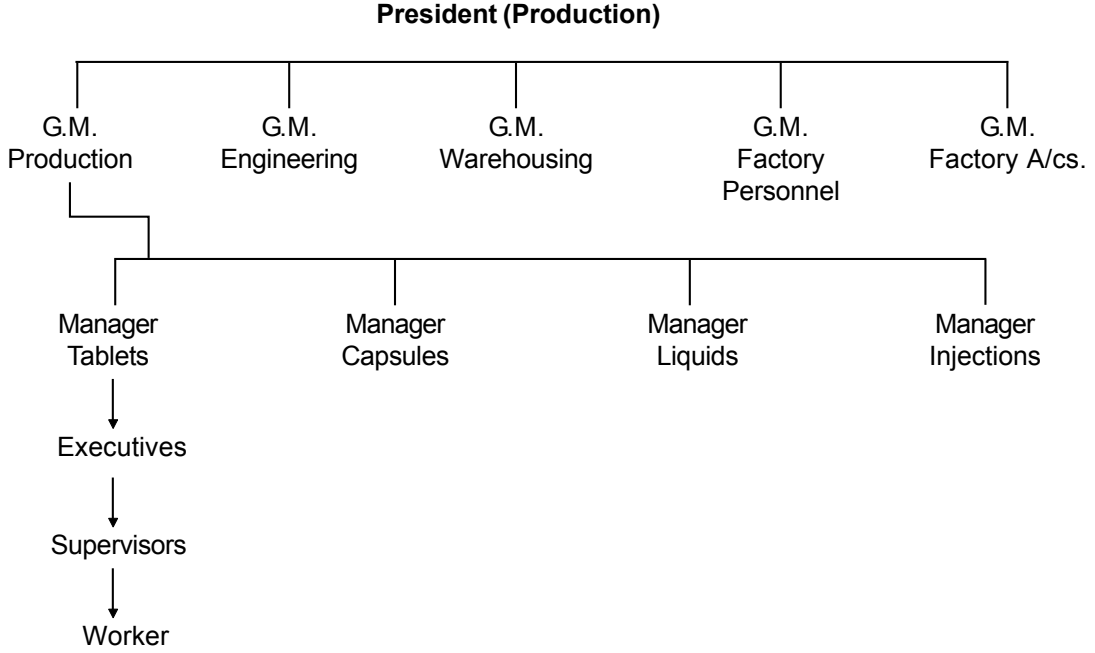
(ii) The manufacturer should have an organization chart. All responsible staff should have their specific duties recorded in written descriptions and adequate authority to carry out their responsibilities. Their duties may be delegated to designated deputies of a satisfactory qualification level. There should be no gaps or unexplained overlaps in the responsibilities of personnel covered with application of GMP (10.3).

Comments

Every organization should have a recorded organization chart. This organization chart should clearly show the organizational structure. Normally two levels of charts are prepared. The chart shows the levels starting from the Chairman of the organization to the functional heads, which looks something like the one shown below:



The organogram is drawn at the level of functional level which starts with the President of the function and looks somewhat like as shown below:



Each of the position shown in the organization chart should have a job description. This job description describes the main job activities of the position. The reporting relationship of the person is clearly described in the job description. The job description is supposed to be explained to the person by his immediate superior and a copy of the same is to be handed over to him and take his signature with the following remark – "The job description was explained to me by Mr. _____ and I have understood the same".

This copy of signed job description remains as a part of documentation system, related to personnel.

(b) MCC South Africa Guidelines (talk in little more details, as below):

(i) Each person engaged in the manufacture processing, packing or storage of a medicine shall have the education, training and experience or combination thereof, to enable that person to perform the assigned functions. (2.4.1)

(ii) Each person responsible for supervising the manufacture, processing, packing or storage of a medicine shall have the education, training and experience or combination thereof, to perform assigned functions in such a manner as to provide assurance that the medicine has the quality, safety, efficacy and availability that it purports or is represented to possess. (2.4.2)

(iii) There shall be an adequate number of qualified personnel to perform and supervise the manufacture, processing, packing or storage of each medicine. (2.4.3)

1.2 Training

People in an organization are the main resource and has more value and importance than other resources like facilities, equipment and materials, provided these people are trained and trained appropriately to carry out their assigned task. A trained person generally has the knowledge, skill and attitude relevant to their job and that too in the appropriate level. Before we discuss more about this we must understand the three main words and their correct perspective. They are:

(i) Training
(ii) Education, and
(iii) Development.

Training

Training may also be defined as the acquisition of technology which permits employees to perform their present jobs to standards. It improves human performance on the job, the employee is presently doing or is being hired to do. Also training is imparted when new technology is introduced into the workplace.

Development

Development is training people to acquire new horizons, technologies or viewpoints. It enables leaders to guide their organizations into new expectations by being proactive than reactive. It enables workers to create better products, faster services, and more competitive organizations. It is learning for growth of the individual, but not related to a specific or future job. Unlike training and education, which can be completely evaluated, development cannot always be fully evaluated. This does not mean that we should abandon development programmes, as helping people to grow and develop is what keeps an organization in the cutting age in the competitive environment. Development can be considered the forefront of what many now call the 'learning organizations'. Development involves changes in a person that are systematic, organized and successive and are thought to serve as an adaptive function.

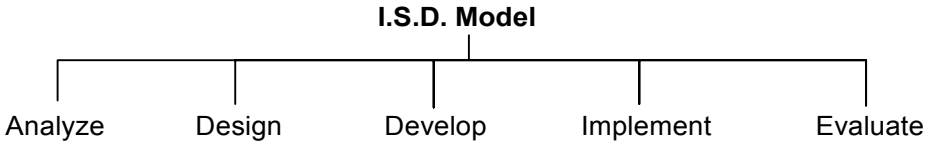
Education

Education is training people to do a different job. It is often given to people who have been identified as being promotable being considered for a new job either lateral or upward or to increase their potential. Unlike training which can be fully evaluated immediately upon the learners returning to work, education can only be completely evaluated when the learners move on to their future jobs or tasks. We can test them on what they learned while in training, but we cannot be fully satisfied with the evaluation until we see how well they perform their new jobs.

There are many methods of training employees during employment. One of the latest methods to train people in employment is by "Instructional System Design (ISD). This involves the basic concept of I.P.O. System, i.e. Input, Process and Output. Here,

- Input is people who need to acquire knowledge, skill and attitude.
- Process is learning that takes place within the system.
- Output is trained person.

The I.S.D. training model can briefly be shown as follows:



What we do here is very simple:

Analyze the system in order to completely understand it, and then describe the goals you wish to achieve in order to correct any shortcomings or faults within the system.

Design a method or model to achieve your goals.

Develop the model into a product (in training, this product is called courseware).

Implement the courseware.

Evaluate the courseware and audit-trail throughout the four phases and in the field to ensure it is heading in the right direction and achieving the desired results.

With this brief introduction about the training and other related activities like development and education, we now see what the regulatory requirements have to say about this aspect of cGMP.

REGULATORY TEXT AND COMMENTS

(a) WHO Guidelines (10.11 TO 10.15)

- **The manufacturer should provide training in accordance with a written programme for all the personnel whose duties take them into production areas or into control laboratories (including the technical, maintenance and cleaning personnel), and for other personnel whose activities could affect the quality of the product. (10.11)**

Comments

The training manual should spell out the details of various types of training to be imparted to the employees in various functions and levels. If a particular type of training is not possible to provide in-house then such training may be provided from outside sources, or an outside trainer may be hired for this purpose.

The following areas may be considered for such training purposes :

- Production
- Quality Control
- Engineering and Maintenance
- Cleaning etc

All the employees working in the organizations should be evaluated for the deficiencies they exhibit in meeting their job requirements and such tailor-made training programmes should be provided to minimize or eliminate the deficiencies observed. Along with the specific functional training, training on GMP should be provided to all employees. Or at least they should be trained in those aspects of GMP which are directly related to their work.

- **Besides basic training on the theory and practice of GMP, newly recruited personnel should receive training appropriate to the duties assigned to them. Continuing training should also be given, and its practical effectiveness should be periodically assessed. Training programmes should be available, approved by the head of either production or quality control, as appropriate. Training records should be kept. (10.12)**

Comments

The training programme should cover the following:

(a) Basic Training in G.M.P. This basic training should at least cover following aspects namely:
    - Concept of quality of pharmaceuticals
    - Good health and hygiene practices
    - Cleanliness of facilities and equipment
    - Sources of contamination and their control
    - Internal Labelling and identification
    - Dress code and entry procedures to process and other critical areas
    - Good housekeeping
    - Importance of documentation etc

(b) S.O.P. based training should be provided to all the employees covering SOPs related to their work.

All training imparted should be evaluated by short-term and long-term evaluation techniques. Short-term evaluation can be done by an objective type question paper at the end of the training session. The long-term evaluations are done on the shop floor with the help of the immediate superiors under whom these employees are working. The real test is to see over-all improvement on shop floor work in terms of reduced mistakes committed by the employees or improvement in productivity of certain specific activities carried out by them, where they were provided training. General improvement of morality of employees and similar positive attitudinal changes can also indicate the effectiveness of training provided to the employees.

All training programmes must be approved by the training head; he may be a separate person professionally trained in imparting training or a suitable person from any of the functional areas like production or quality management etc. These programmes are generally authorized by head of Q.A.

The training records should be maintained. This can ideally be done by providing an individual employees training file. Alternatively a training programme-wise record can also be maintained. In any case, minimum following information should be provided:

- Name of the course and its content.
- Name of trainer.
- Venue of training
- Date and time of training
- Names of trainees
  - Record of evaluation, e.g. questionnaires and their answer sheets.
  - Remarks about evaluation by the trainer or supervisor who has evaluated the training effectiveness of the trainers, etc.

- **Personnel working in the areas where contamination is a hazard, e.g. clean areas or areas where highly active, toxic, infectious or sensitizing materials are handled, should be given specific training. (10.13)**

Comments

Employees working in aseptic operations and other clean room area should be given in training in the following areas:

- Sources of contamination, e.g. people, materials, equipment, facilities, etc.
- Types of contamination, e.g. viable (microbes), and non-viable (particulate matter).
- Basic aspects related to microbiology, disinfection and sterilization.
- Dress code and entry procedures in clean rooms.
- Importance of good health and hygiene practices.
- Infectious diseases etc.
- Handling of hazardous and sensitizing materials, like, potent drugs, poisonous substances, β-lactam drugs, hormones and other steroidal drugs etc.

The employees who are working in these areas should be specifically trained in avoiding exposure of their body by touch or inhalation. They should be informed about the types of adverse effects, these drugs can have on them, if they do not handle them properly and get unnecessarily exposed to such drugs.

- **The concept of quality assurance and all the measures capable of improving its understanding and implementation should be fully discussed during the training sessions.(10.14)**

Comments

The basic concept of Q.A – "Quality cannot be tested into the product, it has to be built into it" – must be stressed and fully explained to all the employees in their training sessions. This makes them aware that we must prevent wrong thing than taking corrective actions after a wrong thing has been done.

- **Visitors or untrained personnel should preferably not be taken into production and quality control areas. If this is unavoidable, they should be given information in advance, particularly about personal hygiene and the prescribed protective clothing. They should be closely supervised. (10.15)**

Comments

Ideally no visitor or untrained person should be allowed in the processing, or storage or any other critical area, where their entry can cause danger to the quality of the product being processed. Normally, if possible, the process area people should come out and discuss any matter with outsiders. In case it is not possible to avoid the entry of the outsider to these areas, then a trained employee should accompany such untrained visitors to the critical area to avoid any untoward situation. The same type of procedure and protective clothing must be provided to all outsiders as per the demand of the SOP.

(b) USFDA Guidelines

- **Each person engaged in the manufacture, processing, packing or holding of a drug product shall have education, training and experience or any combination thereof, to enable that person to perform the assigned functions. Training shall be given in the particular operations that the employee performs and in cGMP as they related to employees functions. Training in cGMP shall be conducted by qualified individuals on a continuing basis and with sufficient frequency to assure that employees remain familiar with cGMP requirements applicable to them. (USFDA, 21 CFR Part – 211.25(a))**
- **Each person responsible for supervising the manufacture, processing, or holding of a drug product shall have the education, training and experience, or any combination thereof, to perform assigned functions in such a manner as to provide assurance that the drug product has the identity, safety, strength, quality and purity that it purports or is represented to possess. (USFDA, 21CFR Part 211.25(b)).**

(c) MCC SOUTH AFRICA Guidelines

- **To assess the effectiveness of training, checks should be carried out to confirm that the designated procedures are being followed by staff at all levels. (M.C.C., S.A. – 2.5.4.)**
- **After formal university education, the pharmacists interns must undergo one-year internship in Industry, being trained as prescribed by the South African Pharmacy Council. (M.C.C. S.A. – 2.5.7)**

Comments

India has a system of certifying qualified pharmacists, chemists, and microbiologists, etc. as "Approved Technical Staff". This approval requires the qualified person should work at least for a period of 18 months in a specific area in which he seeks approval as technical staff. Such approvals are given in separate formulations, manufacturing areas and also in various areas of quality control.

- **After Formal education, the Pharmacist Assistant in industry (Is it operator?) is required to pass the Pharmacy Council's examination which enables the assistant to perform certain functions (not all) of a pharmacist as defined by the Pharmacy council. (M.C.C.S.A. 2.5.8)**

1.3 Personal Hygiene and Health

We have said earlier that the people, who are one of the major inputs or resource to the manufacturing of pharmaceuticals, must be qualified, experienced and trained. This is for the quality of the pharmaceutical products which we are going to manufacture. Now we add the fourth dimension to this and that is, all these people must be healthy and also practice good sanitation. They have good personal hygiene habbits, which they follow, make others also to follow and if they find any lapses in these practices, they should point it out to their superiors, immediately, to take necessary corrective actions. They are initially and thereafter regularly medically checked for their fitness to carry out the given tasks, failing which they are removed from the given task either temporarily or permanently depending upon the individual case in question.

Following are the guidelines provided in the international regulatory authorities on cGMP.

REGULATORY TEXT AND COMMENTS

(a) WHO Guidelines (10.16 to 10.23)

- **All personnel, prior or/and during employment, as appropriate should undergo health examinations. Personnel conducting visual inspections should also undergo periodic eye examinations. (10.16)**

Comments

All employees must undergo pre-employment medical checkup and also every year thereafter, to see that they are medically fit. Visual inspectors must additionally undergo eye-check up at least every six months.

- **All personnel should be trained in the practices of personal hygiene. A high level of personal hygiene should be observed by all those concerned with manufacturing processes. In particular, personnel should be instructed to wash their hands before entering production areas. Signs to this effect should be posted and instructions observed. (10.17)**

Comments

All employees must be trained in the good personal hygiene practices. Some of the factors which should be discussed in such training are as follows:

- Washing and disinfection of hand and feet
- Cleaning and cutting of nails of hand and feet
- Keeping the hair of head and beard protected from the processing area and materials with proper covering
- No cosmetics should be used during processing work
- Ornaments must be removed during work. In case of religious compulsions, such ornaments must be well protected
- Typical examples which need care are, bindi, mangalsootra, wedding, ring etc. With due respect to religious feelings and customs, the author is still of the opinion that, if possible, such things should be avoided, at least during work
- Using of clean uniforms
- Female members of the employee must be additionally trained in the use and disposal of sanitary pads. Female supervisors may be asked to provide proper sanitary practices to other female workers in this regard.

- **Any person shown at any time to have an apparent illness or open lesions that may adversely affect the quality of products should not be allowed to handle starting materials, packaging materials, in-process materials, or drug products until the condition is no longer judged to be a risk. (10.18)**

- **All employees should be instructed and encouraged to report to their immediate supervisor any condition (relating to plant, equipment or personnel) that they consider may adversely affect the products. (10.19)**

Comments

Infectious skin diseases and open lesions are one of the major source of infections. Employees should be encouraged to discuss their issues related to such things with their immediate superiors. The management may provide such employees alternate areas of work where their physical conditions may not adversely affect the job. Alternatively these employees should be given break from duty till such time they recover fully from their condition and declared medically fit by the authorized medical practitioner.

- **Direct contact should be avoided between the operator's hands and starting materials, primary packaging materials and intermediate or bulk products. (10.20)**

Comments

All employees who come in direct contact with the processing material and primary packaging should be advised to use protective gloves (say, powder-free latex or rubber gloves). The employees working in the sterile products area, (say, in aseptic operations) should use double gloves. This is done in many organizations to avoid risk to the product in case of accidental tearing of the protective gloves.

- **To ensure the protection of the product from contamination, personnel should wear clean body coverings appropriate to their duties they perform, including appropriate hair coverings. Used clothes, if reusable, should be stored in separate closed containers and properly laundered and, if necessary, disinfected or sterilized. (10.21)**

Comments

Dress code must be decided as per the criticality of operation e.g.:

Non-processing areas like offices of the factories etc.

Secondary packaging areas.

Non-sterile processing areas and primary packaging areas.

Aseptic and clean room area operations.

Normally non-sterile processing and primary packaging area people should wear an extra cover-all-type garment on their factory uniform.

Employees working in aseptic and other clean areas should wear sterile garments; these garments can be either cleaned and autoclaved or pre-sterilized disposable garments. Such garments must be changed every shift or if possible every exit from the aseptic or clean area.

- **Smoking, eating, drinking and chewing and keeping plants, food, drink, smoking material and personal medicines should not be permitted in production, laboratory, and storage areas or in any other areas where they might adversely influence the product quality. (10.22)**

Comments

One of the major trends today observed in the good pharmaceutical companies is to prepare their employees mentally to avoid use of smoking, chewing tobacco and gutkha, and also drinking of alcohol. Some factories have been declared as smoke free zones. Others have only defined smoking areas in factory. This has shown a good improvement in the health of the employees. If any person is having smoking materials with him, the SOP advises him to deposit at the security office. Even senior officials of the plant are required to go out of the plant and smoke if they desire to smoke. Top management's participation in such activities is a must.

- **Personal hygiene procedures including the use of protective clothing should apply to all persons entering production areas, whether they are temporary of full-time employees or non employees, e.g. contractors employees, visitors, senior managers and inspectors. (10.23)**

Comments

A policy on "dress code for all" must be designed and implemented. While designing aprons and other protective clothing for process employees, no top pockets should be provided. A top pocket may sometimes result in accidental falling of articles kept in top pockets into materials being processed.

(b) TGA/MHRA (Australia/UK) Guidelines:

- **Detailed hygiene programmes should be established and adapted to the different needs within the factory. They should include procedures relating to health, hygiene practices and clothing of personnel. These procedures should be understood and followed in a strict way by every person whose duties take him into production and control areas. Hygiene programmes should be promoted by management and widely discussed during training sessions. (TGA – 2.13)**
- **Any specific requirements for the manufacture of special groups of products, e.g. sterile preparations (should be as per the product-specific requirements). (TGA – 2.20)**

(c) M.C.C. SOUTH AFRICA Guidelines

- **Direct contact should be avoided between the operator's hands and starting materials, intermediates and products (other than when they are in closed container), as well as with any part of the equipment that comes in contact with the products. (2.6.1.5)**

1.4 Key Personnel

The regulatory literature in different countries defines some important jobs as key jobs and the persons who perform these job are called key personnel. The regulatory literature refers following positions as key personnel. These position can be summarized as follows:-

Sr. No.	Position	India	WHO	UK	Aust.	S.A.	U.S.A.
01	Head of Production	-	✓	✓	✓	✓	-
02	Head of Q.C.	-	✓	-	-	✓	-
03	Head of Q.A.	-	-	-	-	✓	-
04	Head of Sales & Distribution	-	✓	-	-	-	-
05	Authorized Person	-	✓	-	-	-	-
06	Managing Director	-	-	-	-	✓	-

REGULATORY TEXT AND COMMENTS

W.H.O Guidelines

- **Key personnel include the head of production, the head of quality control, the head of sales and distribution and the authorized person(s). Normally the key positions should be occupied by full-time personnel. The head of production and quality control should be independent of each other. In large organizations, it may be necessary to delegate some of the functions; however, responsibility cannot be delegated. (10.6)**
- **Key personnel responsible for supervising the manufacture and quality control of pharmaceutical products should possess the qualifications of a scientific education and practical experience required by national legislation. Their education should include study of an appropriate combination of (a) chemistry (analytical or organic) or biochemistry, (b) chemical engineering, (c) microbiology (d) pharmaceutical science and technology, (e) pharmacology and toxicology, (f) physiology or (g) other related sciences. They should also have other adequate practical experience in the manufacture and quality assurance of pharmaceutical products. In order to gain such experience, a preparatory period may be required, during which they should exercise their duties under professional guidance. The scientific education and practical experience of experts should be such as to enable them to exercise independent professional judgment, based on the application of scientific principles and understanding to the practical problems encountered in the manufacture and quality control of the pharmaceutical products. (10.7)**
- **The heads of productions and quality control departments generally have some shared, or jointly exercised, responsibilities relating to quality. These may include, depending on national regulations:**
  - **(a) The authorization of written procedure and other documents, including amendments.**
  - **(b) The monitoring and control of the manufacturing environment.**
  - **(c) Plant hygiene.**
  - **(d) Process validation and calibration of analytical apparatus.**
  - **(e) Training, including the application of principles of quality assurance.**
  - **(f) The approval and monitoring of suppliers materials.**

(g) The approval and monitoring of contract manufacturers.

(h) The designation and monitoring of storage conditions for materials and products.

(i) The retention of records.

(j) The monitoring and compliance with GMP requirements.

(k) The inspection, investigation and taking of samples, in order to monitor factors that may affect product quality. (10.8)

- **The head of production department generally has following responsibilities:**

  (a) To ensure the products are produced and stored according to the appropriate documentation in order to obtain the required quality.

  (b) To approve the instructions relating to production operations, including the in process controls, and to ensure their strict implementation.

  (c) To ensure that the production records are signed by a designated person before they are made available to the quality control department.

  (d) To check the maintenance of the department, premises and equipment.

  (e) To ensure that appropriate process validations and calibrations of control equipment are performed and recorded and the reports are made available.

  (f) To ensure that the required initial and continuing training of production personnel is carried out and adapted according to need. (10.9)

- **The head of quality control department has following responsibilities.**

  (a) To approve or reject starting materials, packaging materials. and intermediate, bulk and finished products.

  (b) To evaluate the batch records.

  (c) To ensure that all necessary testing is carried out.

  (d) To approve sampling instructions, specifications, test methods, and other quality control procedures.

  (e) To approve and monitor analyses carried out under contract.

(f) To check the maintenance of department, premises and equipment.

(g) To ensure that appropriate validations, including those of analytical procedures, and calibrations of control equipment are done.

(h) To ensure that required initial and continuing training of quality control personnel is carried out and adapted according to need. (10.10)

For other duties of Q.C. unit refer to Chapter 5 on Quality Management.

- **Authorized Person**

  The GMP guidelines published by WHO define the authorized person as a person (among key personnel of a manufacturing establishment) responsible for the release of batches of finished products for sale. In some other GMP guides and legal texts the term 'qualified person' is used to describe analogous functions.

  The authorized person, as the overall quality controller, will be a member of a team whose functions include the following major areas.

- Implementation (and, when needed, establishment) of the quality system.
- Participation in the development of company's quality manual.
- Supervision of the regular internal audits or self inspections.
- Oversight of the quality control department.
- Participation in external audit (vendor audit).
- Participation in validation programme.

M.C.C. SOUTH AFRICA Guidelines

- **Head of Quality Assurance is a key position defined by M.C.C. South Africa (2.2). It, however, does not clearly specify any particular responsibilities under the section of key personnel, but provides following guidelines.**
- **Key personnel include the Managing Director, the person responsible for production and the person responsible for Quality Assurance. The person responsible for production and person responsible for Quality Assurance should be different persons of equal level of authority, neither of whom should be**

responsible to the other, but who both have the responsibility for achieving the requisite quality.

(Note: The duties of this person responsible for Quality Assurance are wider than those which may be suggested by terms on "Chief Analyst", "Laboratory Head", etc.) (2.2.2)

- **Persons in responsible position (key persons) should have sufficient authority to discharge their responsibilities. In particular, the person responsible for Quality Assurance should be able to carry out his defined functions impartially. (2.2.3)**
- **Suitably qualified persons should be designated to take up the duties of key personnel during the absence of the latter. (2.2.4)**
- **Key personnel should be provided with adequate supporting staff. (2.2.5)**
- **The way in which various key responsibilities which can influence product quality are allocated and may vary with different manufactures. These responsibilities should be clearly defined and delegated. (2.2.6)**
- **The South African law states that the Managing Director of a pharmaceutical company in South Africa must be a pharmacist residing in the Republic of S.A. and must be registered with the Pharmacy Council of S.A. (2.3)**

  All directors must confirm that they abide by the Pharmacy Council's ethical rules.
- **Detailed responsibilities of the head of sales and distribution are not described in any GMP guidelines.**

1.5 Legal Aspects

Personnel related legal aspects are covered only by Drugs and Cosmetics Act of India: Schedule M; World Health Organization and Medicine Control Council of South Africa.

REGULATORY TEXT AND COMMENTS

(a) WHO guidelines (Ref. to 1.4.2)

(b) Schedule M of D and C Act of India:

- **All manufacturing operations shall be carried out under the supervision of technical staff approved by Licensing Authority.**

Each critical step in the process relating the collection, weighing and measuring of raw materials addition during various stages shall be performed by trained personnel under the direct supervision of approved technical staff.

- **The contents of all vessels and containers used in manufacture and storage during the various manufacturing stages shall be conspicuously labeled with the name of the product, batch number, batch size, and stage of manufacture. Each label should be initialed and dated by the authorized technical staff. (8.1 of Sch. M. D and D Act, India)**

(c) MCC South Africa guidelines

- **South African law lays down certain requirements for pharmaceutical companies, the managing director and pharmacists.**
- **The company and the managing director (who must be pharmacist residing in the Republic) must be registered with the Pharmacy Council.**
- **All directors must confirm that they will abide by Pharmacy Council's ethical rules.**
- **Pharmaceutical operations must be conducted under the constant personal supervision of a pharmacist whose name is displayed over the main entrance.**
- **Certain duties and responsibilities must be performed by pharmacists, e.g. manipulation, preparation or compounding of medicines, manufacturing, furnishing of advise with regard to medicines, distribution and sale of medicines.**
- **South African law further lays down requirements for the following activities:**
  - **Labelling of medicines, including package inserts.**
  - **Records and registers for scheduled medicines.**
  - **Sale of medicines only to registered and approved customers.**
  - **Registration of medicines with the M.C.C.**
  - **Adherence to standards.**

- **Advertising of medicines.**
- **Carrying and supply of professional samples. (physician samples)**
- **In addition to above, South African Law lays down very strict rules about Narcotics and Psychotropic drugs. (2.3)**

1.6 Consultants

1.6.1 Origin and Meaning

The word consultant has it origin in Latin (consultants means "Legal Expert"). Presently a consultant is a professional who provides expert advice in a particular area of expertise.

The main difference between a consultant and 'normal' expert is that the consultant himself is not employed with his client, but instead is in business for himself or for a consultancy firm, usually with multiple and changing clients. Thus his clients have access to deeper levels of expertise than would be feasible for them to retain in-house, especially if the specialty is needed comparatively rarely. It is generally accepted good corporate governance to hire consultant as and when needed.

Often a consultant provides expertise to clients who require a particular type of knowledge or service for a specific period of time, thus providing an economy to the client. In other solutions, companies implementing a major project may need an additional experienced staff to assist with increased work during that period.

More recently the term is also used for temporary staff. That resource is only temporarily employed by a company to augment the company's core set of employees without providing any unique expertise. This usually indicates that the consultant could be expended when demand for that particular skill diminishes, though this expendability is sometimes recompensed with higher pay.

The consultant is usually employed through a limited company which they themselves own.

Sometimes a consultant is not an independent agent but is a partner or an employee of a consultancy firm; that is, a company that provides

consultants to clients on a larger scale or in multiple, though usually related skill areas. This has advantage both to the client and the consultant by:

- Providing a pool of talent that can be quickly mobilized as required.
- Reassuring the client about the quality of the consultant supplied.
- Giving the client access to the experience and methodologies of the whole consultancy rather than an individual.
- Introducing the consultant to new experiences and techniques which may eventually permeate through the consultancy as a whole.

"Strategy Consultants" is an important category of consultants. They are common in upper management in many industries. There are also independent consultants who act as interim executives with decision-making power under corporate policies or statutes. They may sit on specially constituted boards or committees.

1.6.2 Guidelines

Only U.S.F.D.A. and M.C.C. South Africa GMP guidelines talk about consultants. Let us see what those guidelines talk about.

REGULATORY TEXT AND COMMENTS

(a) USFDA Guideline

- **Consultants advising on manufacture, processing, packing or holding of drug and products shall have sufficient education, training and experience or any combination thereof, to advise on the subject, for which they are retained. Records shall be maintained stating the name, address, and qualifications of any consultants and the type of service they provide. (U.S.F.D.A. 21CFR part 211.34)**

(b) MCC SOUTH AFRICA Guideline

- **Only in exceptional circumstances should persons engaged part-time or in consultative capacity be appointed to key positions. Consultants advising on the manufacture, processing, packing, or storage of medicines shall have sufficient education, training and experience, or any combination thereof to advise on the subject, for which they are retained. Records shall be maintained stating the name, address and qualifications of any consultants and the type of service they provide. (M.C.C. South Africa 2.2.7)**

Comments

Consultants are hired by the organizations for specific expertise required, which may not be available in-house and also it is required only for a short duration of time or only for a specific occasional task. For tasks which are of permanent nature, generally, consultants are not hired.

Consultants have been hired for some of the following tasks:

- Training of employees
- Documentation designing
- Designing of validation programmes
- Some aspects of regulatory affairs
- Designing of Production Planning and Control Systems
- GMP/GLP audits, etc

Ideally some knowledgeable employee should be asked to work closely with the consultants. So that the knowledge and skills can be easily transformed from the consultant to the other people through this person.

Consultants are of two types. One is called “Knowledge Consultant”. He provides you data, information, knowledge, etc. but does not participate in the implementation process in the organization. The implementation is altogether left to the organization. Second type of consultants are called “Process Consultants”. They provide data, information, other knowledge inputs, and also participate in implementation.

He trains organization employees and workers with them in implementing the system for a given task or activity and as the employees take over the implementation process, he phases out slowly from the process. Thus now the implementation process is fully governed by the organization employees.

It must be seen that the consultant has the appropriate knowledge, skill, education and experience required, for which he is hired. He should also have a feel of the pharmaceutical operations, in addition to his area of expertise.

1.7 Documents And Formats

Document Title 01: Training Manual

This manual should cover company policies on employees' training need identifications, designing training programmes, conducting and evaluation of training programmes. Records of all training activities must be maintained up-to-date.

Each organization should have training manual specifying the policy and procedures related to training of employees. Employees can be divided mainly into 3 groups :

- Workers
- Supervisors
- Managers and Administrators

The training is also mainly divided into 3 parts or areas :

- GMP/GLP/GVP-related training
- Job-specific training
- Behavioral and managerial training

Training can be provided in-house or employees can be sent outside.

Various methods can be used for training people in-house eg. lectures, group work, in-basket management games, role playing, etc. For supervisor and managerial training. International Labour Office Geneva's supervisory development manuals are very useful. The author has successfully used these manuals in companies like Ranbaxy, Wockhardt, Intas, Plethico and Alkem, etc.

This training manual should have at least the following information.

(i) Classification of employees requiring training.

(ii) Procedure for identifying training needs. (This may be based on job descriptions of various employees).

(iii) Proposed list of training programmes with contents.

(iv) Designing course of training based on needs of employees.

(v) Frequency of training and time required for each programme, specifying how many people can be effectively trained in one group (normally not less than 5 and not more than 20, should be a reasonable number).

(vi) Qualification and experience of in-house and outside trainers.

(vii) Training records to be maintained.

(viii) Immediate and long-term evaluation techniques and records of the same.

(ix) List of recommended books in the training library.

(x) List of training aids required e.g. O.H.P. Slide projector, T.V./V.C.R./ D.V.D./Flip charts, models, etc.

(xi) List of recommended outside institutions providing training to the employees.

(xii) Percentage of time each employee should spend on training each year. A 3 to 5% time is normally recommended for training and new learning for each employee. This amounts to about 10 to 15 days of training per employee per year, which includes in-house and outside training.

(xiii) Policy and procedure for developing selected in-house trainers, etc. Following minimum records should be maintained.

(A) Attendance records of training

This record should have the following details:

(i) Subject of training

(ii) Name, qualifications, experience, designation of trainer

(iii) Name, designation and department of trainee along with his/ her signature on attendance record

(iv) Date and time of training

(v) Venue/location of training etc.

(B) Training evaluation record

(i) Training evaluation should be done on immediate and long-term basis.

(ii) Immediate training should be based on objective type tests, which is to be conducted immediately after the training session is over. This test should not be more than two A 4 size papers and containing 10 to 15 objective questions.

(iii) The top of the paper should cover minimum following information:

(a) Name of the trainee/designation/department to which he belongs

(b) Details of the trainer and evaluator

(c) Subject of training

(d) Date and time of training

(e) Venue/Location

(f) At the bottom, comments of the evaluator may be written. These comments may be for department head and/or the trainee himself.

Document Title 02: Job Description of Key Personnel

The key personnel should be as follows:

- Head of Q.C. and Q.A.
- Head of production
- Head of sales and distribution
- Authorized person
- Managing Director of the company

Each job should be described under the following headings:

(i) Name and title or designation of the person

(ii) Department and location (normal place of work, i.e. name of city)

(iii) Reporting relationship (including dual reporting if any, a personnel manager at factory may be reporting to factory manager, administratively and to the Vice President-Personnel, functionally)

(iv) Job summary

(v) Detailed job description

(vi) Authorisation (signature of head of personnel or plant head or functional or department head etc.)

(vii) Signature with date of employees for having received the job description and understood.

Note: These days, some companies are providing very detailed job description, including listing of various reports he has to make routinely and guidelines on how he will be evaluated on his job performance etc.

Document Title 03: Penicillin Sensitivity Tests

The employees working in penicillin (and may be other sensitive material areas, e.g. other Beta-lactams) section should undergo the sensitivity tests for the materials they are handling. This is conducted by an expert physician or a physician who is trained in allergy testing.

The report should have following details :

(i) Name of the employee
(ii) Date of testing
(iii) Substance for which the test was carried out
(iv) Conclusion/remarks of the test performed
(v) Certification of the employee for the sensitivity by the testing physician etc.

Document Title 04 : Pre-and-Post-Employment Medical Checkup of Employees

Compliance with the requirements that no production process should be carried out by employees who are sick or have any open wound etc. starts from the pre-employment medical check up and regularly at a predefined frequency (Normally 6 months to one year) thereafter. This should include minimum following tests.

(i) General physical checkup by a qualified physician
(ii) Chest X- ray
(iii) Wassermann Test
(iv) Tuberculosis Test
(v) Investigation of specific diseases like, hypertension, diabetes etc.
(vi) In specific cases a test for AIDS may be added
(vii) Employee requiring to do visual inspection activities should be examined for eyesight, every six months
(viii) Complete blood-profile
(ix) Company must maintain all records of such pre-and post-employment medical examination and advise the employee suitably, if required, by the company physician

Document Title 05 : SOP on Personal Hygiene

Pharmaceutical manufacturing operation should always be carried out by the employees who are healthy and practice good sanitation and hygiene practices.

This SOP should spell out how the employees should follow the sanitation and hygiene practices. This should normally cover the following:

(i) Washing and drying of hands and feet to clean them, after the use of toilet facilities and before entering the processing or packaging area

(ii) Avoiding of drinking, chewing, smoking and eating in processing, packaging, storage, Q.C. labs, animal houses, and other working area and change rooms

(iii) Avoiding use of jewellery, watches, face make ups etc

(iv) Reporting of sickness injuries etc. to immediate supervisor and seek his advice

(v) Wearing only clean uniforms

(vi) Avoiding spitting

(vii) Proper use of antiseptics and disinfectants etc.

(viii) Proper maintenance of hair, beards, nails, etc.

(ix) Woman employees should be specifically trained by suitable woman trainers about healthy practices during the M.C. periods.

Document Title 06: SOP on Handling of Illness of Employees

This SOP should address the following points:

(i) Procedure for reporting on the job illness to the immediate supervisor.

(ii) Action required to be taken by the supervisor and ill employee.

(iii) Isolating the ill employee from the workplace till such time he is declared fit to work again by a suitable authorized person or a registered physician.

(iv) Records of all illnesses of employees to be maintained and should be available in the company with the appropriate authorities, e.g. personnel manager's office etc.

Document Title 07 : SOP on Dress Code

This SOP should spell out type of uniforms worn by the various categories of employees in the plant and the clothing management in general. This SOP should have the following details:

- Clothing matrix, i.e. what are the component of uniforms and who has to wear it, where and when, etc.
- Laundering of the uniforms and related other clothing
- Special treatment for sterile clothing, lint free cloth, e.g. nylon or decron cloth (sterilization of washed cloths etc.)
- Method of wearing the uniforms
- Disposal of torn and worn-out uniforms
- Repairing of uniforms which can be reused
- The pharma uniforms may generally cover the following items.
  1. Caps/Hair cover
  2. Beard and moustache cover
  3. Coats, coveralls, shirts, pants, etc. without top pockets
  4. Gloves (Disposable or other suitable materials)
  5. Shoes covers (if required in specific area)
  6. Masks
  7. Safety glasses/Goggles/Shields
  8. Respiratory suites
  9. Ear plugs (in high noise level working areas)
- Work clothing should not be worn outside the appropriate plant area and changing rooms should be available separately for gents and ladies.
- While designing the uniforms socio-cultural factor should also be taken into account.

(**Note :** Half skirt and top was an accepted uniform for ladies in multinational companies, but these days it is changed to salwar-kamees. Once total white uniform was rejected by lady employees on religious grounds, saying that total white dress is used only by widows).

Document Title 08 : SOP on Management of Change Rooms

This SOP should cover the following points:

(i) Cleaning and sanitation procedures to be followed for the change rooms, including, urinals, toilets, bathrooms, hand and feet wash places. Storage and distribution areas for uniforms and dress change areas

(ii) Regular cleaning and sanitation of uniform cupboards provided to employees

(iii) Frequency of laundering of employee uniforms

(iv) Frequency and method of cleaning and sanitation or disinfection of shoes and slippers used by employees

(v) Procedure for air circulation in change rooms and also in the compartmented uniform storage cupboards

(vi) Records of U.V. light usage in the cupboards provided in change rooms of asepctic operations area

(vii) Records of all activities related to housekeeping of change rooms, laundering of uniforms and cleaning and sanitations of footwear must be maintained and presented for inspection on demand by the inspecting authorities

Document Title 09 : SOP on Organisation Policy on Smoking, Eating, Chewing And Drinking

Currently, there is a trend in many pharmaceutical organisation to declare the entire site as 'no smoking' and 'no chewing' zone. An employee counseling programme should be conducted to emphasize these points.

Document Title 10 : SOP on Training on Motivation of Employees

All employees working in pharmaceutical operations should be well-trained and motivated.

Trained employee means one who has appropriate knowledge, skill and attitude. Proper appropriate attitude can come only from highly motivated employees. The SOP on training on motivation should cover the following points.

(i) What is motivation?

(ii) Factors that motivate employees e.g :

- Monitory factors
- Working environment (clean, hygienic)
- Respect for job they do
- Importance of their job and its social contribution to the improvement of health of people in society
- Job satisfaction at workplace
- Good human relations at workplace etc.

Document Title 11 : SOP on Prevention of Unauthorized Persons in Production and in Other Critical Areas of Operation

This SOP should address the following issues.

(i) Who is authorized and unauthorized person in a specific area?

(ii) Which areas are declared as critical operations area, e.g. all processing areas packaging areas and area of storage where sterile raw material is stored?

(iii) Most of the companies have now started giving electromagnetic entry cards to their employees who work in most critical areas like aseptic filling operations. (e.g. Alkem Laboratories Ltd.)

(iv) Records of entry in critical operation area are maintained

(v) Name of the authorized employee must be exhibited at the entry point

Document Title 12 : Records of Consultants

Inclusion of this clause by U.S.F.D.A. regulation (C.F.R. 211.34) is to impress that only capable people work as consultants for pharmaceutical industry, particularly on technical consultation work.

This record should have the following details:

(i) Name of the consultant

(ii) Educational qualifications

(iii) Professional qualification and experience

(iv) Address: Postal address and phone/Fax/email, etc. of his office and residence

(v) Area covered by the consultant for providing consultancy

Format Title 01 : List of Technical Staff With Qualifications, Experience and F.D.A. Approvals, if Any

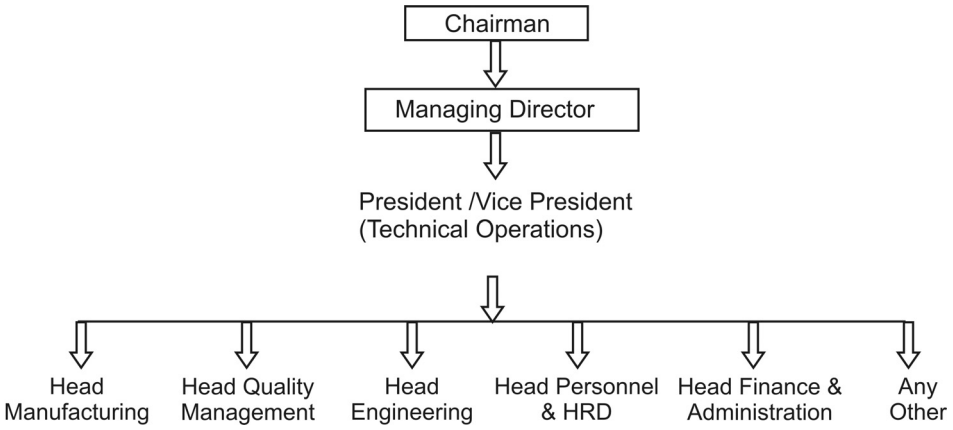
INDIAN PHARMACEUTICALS LTD.
LIST OF TECHNICAL STAFF

DEPARTMENT :

Sr. No	Name	Dt. of joining	Desig-nation	Qualification		Experience in Years			FDA Approvals		
				Degree/ Diploma	Year of Passing	In this Company	Outside this company	Total	Dept	State	Year and Ref.

Format Title 02 : Organogram at Overall Organisation Level

Organizational level organogram should start from the Chairman/Managing Director level in the organization and end at the departmental head level.



Format Title 03 : Planned and Used Plant Capacity

A statement of plant capacity planned and at present used (to prove that you have sufficient number of people to carry out the various tasks).

Planned Plant Capacity (And capacity presently in use)
As on 1st April 2007.

Sr. No	Department	Planned Capacity			%of planned capacity presently used
		One day (1Shift)	One month (25 Shifts)	One year (300 Shift)	
01	Tablets	20 lacs	500 lacs	60.0 crores	70 %
02	Capsules	5 lacs	125 lacs	15.0 crores	50 %
03	Liq. Orals	50,000	12.5 lacs	1.5 lacs	60 %
04	Ointments	20,000	5 lacs	60 lacs	80 %
05	Liq.Inj.Amp	1,00,000	25 lacs	3.0 crores	40 %
06	Liq.Inj.Vial	50,000	12.5 lacs	1.5 crores	65 %
07	Others	-	-	-	-

Above is an arbitrary example, how the statement should look like.

Format Title 04 : Personnel Training Records

INDIAN PHARMACEUTICALS LTD.
PERSONNEL TRAINING RECORD

Date	**:**
Topic	**:**
Trainer	**:**
Method	**:**
Time	**:**
Venue	**:**

Sr.No	Name of Participant	Department	Signature

Format Title 05 : Personnel Training Evaluation Records

INDIAN PHARMACEUTICALS LTD.
PERSONNEL TRAINING EVALUATION RECORD

Sr.No	Name of Participant	Department	Evaluation (out of 100 marks)

Format Title 06 : SOP Training Records

INDIAN PHARMACEUTICALS LTD.
SOP TRAINING RECORD

SOP Title		**Date**
SOP No		**Trained by**
Rev No.		**Ref. SOP No.**

Sr.No	Name of Participant	Signature

Format Title 07 : Uniforms Laundering Records

INDIAN PHARMACEUTICALS LTD.
UNIFORMS LAUNDERING RECORD

Month :
Ref. SOP No.

For Laundering to sub contractor					Received after laundering			
Date	**Item**	**No. of item**	**Received by (sub contracts)**	**Given by**	**Date**	**Item**	**Qty**	**Received by**

Format Title 08 : Housekeeping, Cleaning And Disinfection Record

INDIAN PHARMACEUTICALS LTD.
HOUSE KEEPING, CLEANING AND DISINFECTION RECORD

Deptt.		**Month**	
Area		**Ref. SOP No.**	
Room No.			

Days	Disinfectant/ Cleaning agent (Conc. Water)	Floor	Walls	Ceiling	Area, doors & corridors	Tables and chair	Toilet	Water tank	View panels	Done	check
M	Dettol 2.5 %										
	Savlon 2.5%										
	Washing powder										
	Colin Spray										
T	Dettol 2.5 %										
	Savlon 2.5%										
	Washing powder										
	Colin Spray										
W	Dettol 2.5 %										
	Savlon 2.5%										
	Washing powder										
	Colin Spray										
T	Dettol 2.5 %										
	Savlon 2.5%										
	Washing powder										
	Colin Spray										
F	Dettol 2.5 %										
	Savlon 2.5%										
	Washing powder										
	Colin Spray										
S	Dettol 2.5 %										
	Savlon 2.5%										
	Washing powder										
	Colin Spray										

Format Title 09 : Certificate of Medical Check-Up

INDIAN PHARMACEUTICALS LTD.
CERTIFICATE OF MEDICAL CHECK-UP

Name and address of the person examined :	
Sex :	
Age :	
Marital status :	
Blood Group :	

He/She is examined for the following:

Height	
Weight	
Pulse	
Eye-Sight	
Respiratory Diseases	
Gastrointestinal Diseases	
Cardiovascular Diseases	
Abnormality of CNS	
Leprosy, Skin Disease, AIDS	
Any contagious and communicable disease	
Sensitivity test of penicillin and	

He/She needs following treatment/investigation.

1.
2.
3.
4.

DECLARATION

He/She is medically fit/unfit for any type of job.

Signature of Examining Doctor,

Place :

Date : Seal

Format Title 10 : Sanitation Record:

INDIAN PHARMACEUTICALS LTD.
SANITATION RECORD

Dept.	**Month**
Area	**Ref. SOP No.**
Room No.	

Factory comp-ound	Floor mats	Corridors / Passage	Stair cases	Wash basins	Ceiling	Toilet seats	Walls	Doors	Tube light /fans	Approach roads	Cleaned and checked

Format Title 11 : Footwear Cleaning Record:

INDIAN PHARMACEUTICALS LTD.
FOOT WEAR CLEANING & DISINFECTION RECORD

Ref. SOP No: _____

Month : _____

Day	Date	No. of Foot Wears	Cleaning & Disinfection	Cleaning & Disinfection		Checked by
				From	To	