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Prequalification Unit Inspection services
WHO PUBLIC INSPECTION REPORT
Finished Product Manufacturer

Part 1	**General information**
Manufacturers details	
Name of manufacturer	Medopharm Private Limited, Unit II
Corporate address of manufacturer	Medopharm Private Limited, Medohouse, No.25, Puliyur 2nd Main Road, Trustpuram, Chennai-600 024, Tamil Nadu, India. Tel No.: 0091-44-40149999 Fax: 0091-44- 40149981 Email: info@medopharm.com Website: www.medopharm.com
Inspected site	
Name & address of inspected manufacturing site if different from that given above	Medopharm Private Limited, Unit II, No. 50, Kayarambedu Village, Guduvanchery - 603 202, Tamil Nadu, India GPS coordinates: North latitude: 12.796735 East longitude: 12.796735 D-U-N-S: Not presented
Unit / block / workshop number	Unit II
Manufacturing license number	TN00004046 and Form 25
Dates of inspection	08 – 12 November 2021
Type of inspection	Initial

<table>
<tr><th>Introduction</th><th></th></tr>
<tr><td>Brief description of the manufacturing activities</td><td>Manufacture, quality control and release of human medicinal products.</td></tr>
<tr><td>General information about the company and site</td><td>Medopharm was established in 1970 by Mr Shri Mohanmalji Chordia. Medopharm is in the field of pharmaceutical formulations manufacturing since last four decades and has three units.
Unit II (Guduvanchery Chennai Tamil Nadu): is for Solid Oral Dosage Formulations manufacturing unit for production of general category Tablets formulations in generics & branded generics, for domestic as well as exports to other countries for its own marketing, contract manufacturing for third parties and co-marketing.

Unit I (Guduvanchery Chennai Tamil Nadu): located in the same site as Unit II, dedicated for manufacturing of betalactam oral dosage formulations (tablets, capsules and dry powders for Suspension.

Unit III (Malur, Karnataka State): for general category tablets and capsules.

The Unit I and Unit II are sharing facilities and services like quality control, stability storage, control sample storage, central finished goods warehouse. The quality assurance system of the two sites was separated but harmonized.</td></tr>
<tr><td>History</td><td>This was the first PQT inspection of this site.
The Unit II has been inspected by the following authorities:
<table>
<tr><td>Republic of Kenya, Ministry of Health Pharmacy and Poisons Board (PPB)</td><td>11th to 13th April 2017

Extension of GMP received due to Covid - 19 pandemic</td></tr>
<tr><td>Food and Drugs Board, Ghana</td><td>25th & 26th May 2017</td></tr>
<tr><td>United Nations Children's Fund (UNICEF)</td><td>11th & 12th October 2017</td></tr>
<tr><td>Tanzania Medicines and Medicinal Devices Authority</td><td>8th & 9th December 2017

Extension of GMP received due to Covid-19 pandemic</td></tr>
<tr><td>USAID (U.S. Pharmacopeial Convention)</td><td>16th to 19th December 2017
6th to 9th September 2018
22nd to 26th July 2019</td></tr>
<tr><td>Pharmacy Medicine and Poison Board, Malawi</td><td>30th April 2018</td></tr>
<tr><td>Ministry of Health (MOH Yemen)</td><td>7th to 9th May 2018</td></tr>
<tr><td>National Drug Authority, Uganda</td><td>4th & 5th February 2019</td></tr>
<tr><td>Central Drugs Standard Control Organization (Drugs Control Department) GMP, India</td><td>7th & 8th March 2019</td></tr>
<tr><td>Medicines Control Agency Zimbabwe</td><td>26th to 27th August 2019</td></tr>
<tr><td>National Agency for Food and Drug Administration and Control (NAFDAC), Nigeria</td><td>22nd September 2019</td></tr>
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	State Service of Ukraine on Medicines and Drugs Control (SMDC)	9th to 12th December 2019
	Food, Medicine and Health Care Administration and Control Authority, Ethiopia	28th & 29th April 2021

Brief report of inspection activities undertaken – Scope and limitations	
Areas inspected	See Part 2 below
Restrictions	N/A
Out of scope	Products out of scope of WHO PQ
WHO products covered by the inspection	Praziquantel Tablet, Film-coated 600mg Albendazole Tablets, Chewable 400mg

Abbreviations	**Meaning**
ADE	Acceptable daily exposure
ADR	Adverse drug reaction
AHU	Air handling unit
ALCOA	Attributable, legible, contemporaneous, original and accurate
API	Active pharmaceutical ingredient
APQR	Annual product quality review
APS	Aseptic process simulation
AQL	Acceptance quality limit
BMR	Batch manufacturing record
BPR	Batch production record
CC	Change control
CCEA	Complete, consistent, enduring, presented
CFU	Colony-forming unit
CIP	Cleaning in place
CoA	Certificate of analysis
CpK	Process capability
DQ	Design qualification
EDI	Electronic deionization
EM	Environmental monitoring
FMEA	Failure modes and effects analysis
FPP	Finished pharmaceutical product
FTA	Fault tree analysis
GMP	Good manufacturing practices
GPT	Growth promotion test
HEPA	High efficiency particulate air
HPLC	High performance liquid chromatography (or high-performance liquid chromatography equipment)
HVAC	Heating, ventilation and air conditioning
IQ	Installation qualification
LAF	Laminar air flow
LIMS	Laboratory information management system
LoD	Loss in drying
MB	Microbiology
MBL	Microbiology laboratory
MF	Master formulae

MFT	Media fill Test
MR	Management review
NC	Non-conformity
NCA	National control authority
NCL	National control laboratory
NRA	National regulatory agency
OQ	Operational qualification
PDE	Permitted daily exposure
PHA	Process hazard analysis
PLC	Programmable logic controller
PM	Preventive maintenance
PQ	Performance qualification
PQR	Product quality review
PQS	Pharmaceutical quality system
PW	Purified water
QA	Quality assurance
QC	Quality control
QCL	Quality control laboratory
QMS	Quality management system
QRM	Quality risk management
RA	Risk assessment
RCA	Root cause analysis
RO	Reverse osmosis
SIP	Sterilization in place
SMF	Site master file
SOP	Standard operating procedure
URS	User requirements specifications
UV	Ultraviolet-visible spectrophotometer
WFI	Water for injection

Part 2	Summary of the findings and comments

1. Quality system

Principle

Production and control operations were specified in written form and GMP requirements were essentially being met. Managerial responsibilities were specified in written job descriptions. Product and processes were monitored, and the results were discussed as part of the approval process for batch release. Regular monitoring and reviews of the quality of pharmaceutical products were being conducted according to documented schedules and procedures.

Data integrity policy

Data integrity policy was in place. SOP "Data Integrity" was discussed. SOP was applicable to all data generated manually or electronically.

Product Quality Review (PQR)

SOP "Product quality review" and PQR planner for 2021 were discussed. Critical Quality Attributes and Process Parameters were defined. PQRs were carried out annually covering periods from January to December. According to the SOP PRQs should be finalized by March next year.

The products manufactured at the Unit were identified by "Item Codes" recorded in the Product Identity Register.

The following PQRs were discussed.

- Praziquantel 600

Addition to the PQRs prepared annually, there was a process verification program in place. SOP "Continuous process verification" was discussed. SOP explained statistical evaluation of production after every 30th batch.

Management review (MR)

SOP "Procedure for Quality System Review (further in the text MR)" was discussed.
According to the SOP MR should be carried out quarterly. SOP also explained Senior Management review meeting procedure. Senior Management review meetings were carried out monthly, minimum standard agenda was specified, meeting minutes were submitted to the CEO and to all participants to be discussed during MR meeting. Senior management meeting minutes were discussed during MR meeting. Agenda for core MR meeting was also specified.

Change control (CC)

SOP 4 "Change Control" and registers for 2020 and 2021 were discussed. CCs were managed through Electronic Quality Management System (EQMS). SOP was applicable to:

- Facility/equipment/instrument/support system/personnel
- Product quality/process/labelling/materials/analytical methods/artwork/specifications
- Changes in system/procedure/Document/computer software
- Any other element that can impact product quality or safety

Changes were classified as:
- Minor
- Major
- Critical

A number of CC were discussed.

Deviation management
SOP "Handling of deviations" and deviation registers for 2020 and 2021 were discussed. SOP was applicable to any unusual or unexpected occurrences that occur during manufacturing, packaging, storage and internal distribution which can result in a risk to product quality, safety, integrity, identity and efficacy. Deviations were specified as Planned deviations and Unplanned deviations. Deviations were managed through EQMS.
Classification:
- Minor
- Major
- Critical

Deviations were tended, according to the SOP trending shall be done half yearly on cumulative bases, annual review shall be done by the Head of QMS along with Head QA.

Root Cause Analysis
SOP "Root cause analysis" was discussed. SOP was applicable to all investigations carried out to any non-conformance. Ishikawa diagram and 5 Why`s were used for Root Cause investigations.

Corrective and preventive actions (CAPAs)
SOP "Corrective and Preventive action" and registers for 2020 and 2021 were discussed. SOP was applicable to non-conformances. CAPAs were managed through EQMS.

Complaints
A system was in place to review complaints and other information concerning potentially defective products. SOP "Handling of Market Complaints" and complaints register for 2020 and 2021 were discussed. SOP explained actions to be taken, including the need to consider a recall, in the case of a complaint concerning a possible product defect. Complaints concerning a product defect were recorded with original details and investigated.

SOP was applicable to complaints related to quality, safety and efficacy. Complaints were categorized as:
- Category I – Critical Defect
- Category II – Major Defect
- Category III – Minor Defect

Investigation was carried out by team consisting of QA person and persons from concerned department. Root cause analysis methodology was applied.

A number of complaints were checked.

Recalls
A system was in place to recall from the market, promptly and effectively, products known or suspected to be defective. Recall SOP was regularly discussed and updated.

SOP ¨Product Recall" and recall registers were discussed. Head QA and Recall Committee were responsible for handling of recalls. Recalls were categorized:

- Category – I, recall within 24 hours
- Category – II, recall within 72 ours
- Category – III, recall within 15 days
- Category – IV
- Category – V

Product recall / withdrawal Approval proforma should be used in case of recall. Till the date of inspection, no product recalls were carried out.

SOP "Mock Recall" was discussed. According to the SOP Mock recall should be carried out annually: mock recall should be initiated for the longest / utmost supply chain to ensure the efficiency of recall mechanism.

Returns
SOP "Handling of Returned Products" and returned products register were discussed. Till the date of inspection, no products were returned.

Self-inspection
System for self-inspection was in place and provided a minimum and uniform standard of requirements. SOP "Self-Inspection" and Self-Inspection report for October 2021 were discussed.
Deficiencies were classified as:

- Critical
- Major
- Minor

Self-inspection team was appointed by the management, it consisted of in-house qualified individuals who completed competency assessment program and were certified by the Head QA. List of certified auditors as well as Self-inspection schedule for 2021 were discussed.

Quality risk management
SOP was applicable to QMS (major deviations, CC or quality failure), development, manufacturing, distribution, submission / review process of drug products, use of starting materials, packaging and labelling materials. Ishikawa diagram was used to identify the risks. FMEA was used for risk evaluation.

A number of risk assessments were checked.

Suppliers approval
A system was in place for supplier's approval. Before suppliers were approved and included in the approved suppliers' list they were evaluated.

SOP 4 "Vendor Approval and Disqualification System" and approved vendors lists (APIs, excipients and packaging materials) were discussed. SOP was applicable to raw and packaging materials vendors. Approved vendors performance evaluation was carried out.

Approved suppliers list was revised every 6 months. In case new vendor was approved in between revision period, notification was sent to concerned departments and list was amended. Vendors audit schedule for 2021 was discussed.

A number of vendors audit reports were checked.

Batch release

SOP "Issue, Completion, Review of MBR, BPR and Batch Release" and SOP "Testing and release / Rejection of Intermediate and Finished Products" were discussed.

Analytical records

SOP "Verification and approval of analytical reports" was discussed. Product related test protocols were issued together with BMR/BPRs. Samples were taken by IPQC personnel and along with Test Protocols transferred to the QC lab. After analysis Test Protocols were evaluated as per Analytical report verification check list. Each page of the report was signed by the analyst and discussed by the Section Head. Afterwards report was approved by Head of QC. After approval reports were transferred for Analytical Quality Assurance review.

Batch numbering

SOP "Batch Numbering System" and BMR/BPR Batch Issue Register

Personnel

Medopharm had an adequate number of personnel with the necessary qualifications and practical experience. In total company employed 147 permanent staff members:

- Administration – 4
- HR – 3
- Production – 20
- Packaging – 21
- Stores – 6
- Maintenance – 7
- Quality Assurance – 18
- Quality Control – 68

Company also employed contract workers.

The following documents were discussed:

- SOP "Health and hygiene". Medical examination was carried out annually for permanent employees and contract employees. Eye test was required for employees who were conducting the visual inspections.
- SOP "Procedure for Medical Check-up"
- SOP "Training of Personnel", training schedule for 2021. SOP was applicable for permanent employees and contract employees.
- SOP "Training and Validation of Analytical Chemists". Qualification of analysts was determined by comparing results generated by a trained analyst. Acceptance criteria for analyst's qualification was specified.
- Analysts' matrix for 2021
- Analysts signature specimen list
- A number of training files were discussed.

Training effectiveness was evaluated by: multiple choice questions, true or false and open questions. Training of employees was well documented.

The entry/exit procedure of the personnel was in place and followed when entering the stores (RM store, PM store, intermedier store and FG day store) and production areas of the main building.

The garment of the staff was washed at the laundry using automatic washing and drying machines. The laundry logbook contained the number of items washed, the checks performed and the number of discarded items.

Personnel movement in the production areas was controlled by electronic door locks with finger print readers.

Documentation
SOP "SOP for SOPs" and SOP "Document and Data Control" were discussed. SOPs were prepared by employee from initiating department, discussed by head of concerned department and approved by Head QA.

Manufacturing activities were recorded in batch manufacturing records.

2. Production system
Production operations followed defined procedures. Access to production premises was restricted to authorized personnel. Production rooms appeared to be well maintained and clean. Stainless steel bins and containers were used for production and storage of in process products. Metal detectors were challenged before and after the batch and every 2 hours during production. Punches/dies rotation was ensured, dimensions checks were performed. The inventory of punches and dies was available. The control usage and maintenance records of tool set for praziquantel were discussed.

Dedicated finger bags were used for different products. Integrity checks on finger bags and screens were carried out.

During inspection inspectors visited the entire production area. The on-going manufacturing activity at the time of the tour was tally with the weekly planner shared by the inspectors.

Validation Master Plan
VMP was presented and discussed.

Process validation
The hold time of materials in the different process phases was evaluated according to the SOP. A number of validation protocols/reports were discussed.

The hold-time studies related to the inspected products were submitted to the WHO.

Reprocessing and rework
There were two types of rejects identified during processing:

- Recoverable rejects
- Non-recoverable rejects

The recoverable rejects were restricted for the packaging related issues. According to the claim of the Company, no other reprocess or rework was acceptable.

3. Facilities and equipment system

Production premises were located, designed, constructed, adapted and maintained to suit the operations to be carried out. Premises were cleaned and disinfected according to detailed written procedures; records were maintained.

Praziquantel Tablet, Film-coated 600mg and Albendazole Tablets, Chewable 400mg were manufactured at Unit II.

Calibration and qualification

The SOP "Equipment qualification" stated that all the critical equipment needs to be qualified. The qualification documents of FBD XX was discussed.

The production equipment was due for equipment performance review in every 2 years and requalification in every 5 years. The schedule was attached to the validation master plan.

The calibration planner and the certificates of two temperature sensors belonging to the coating machine were discussed and available. The calibration was performed by an accredited calibration laboratory.

All the equipment undergoes a preventive maintenance program. The preventive maintenance of the FBD XX was discussed. The monthly and annual maintenance logs were available.

According to the SOP "Breakdown and repair", all the events were reported in a logbook.

Cleaning validation

SOP "Cleaning validation" was discussed. PDE values were established for all molecules. The PDE values were provided by a contract partner (authorized for toxicology services with expertise proven by CV) upon a technical agreement and available for every APIs used by the company.

The cleaning validation documents of Granulation I equipment were discussed.

Computerized systems and Software

Amongst others the laboratory was equipped with the following main equipment:

- HPLCs 13
- UV spectrophotometer 1
- IR spectrophotometer 1
- Gas chromatograph 2
- Dissolution tester 2
- Friability tester 1
- Balances (analytical, semimicro and electronic) 7

The operation, calibration, maintenance and access control and data management practice of the laboratory was discussed upon HPLC QC XX. The HPLC was connected to the OpenLabs server, classified as critical equipment, calibrated and validated.

The monthly calibration schedule indicated the calibrations due in every 6 months. The calibration documents were discussed.

The system and project audit trail of the computer attached to the HPLC XX were available.

The user management and assess control of the personnel was managed according to Electronic Data Management of the Laboratory.

The data backup was daily, weekly, while the projects were archived quarterly on the server and hard drive. The chromatography data (including the data of the calibration) were regularly archived and retrievable. The data restoration test was performed in every 3 months on random projects.

The company policy on computerized system validation was based on GAMP. The software validation documents of the EQMS system were discussed.

Documents discussed:

- Calibration of HPLC with auto sampler
- Operation of HPLC
- Calibration log of HPLC
- Calibration planner of HPLC
- Calibration report for HPLC
- Electronic data management in the laboratory
- Request for restoration of backup data
- Privilege matrix
- Finished product register

Utilities

The utilities (AHUs, potable and purified water system, compressed air), filter washing area and the laundry were located at the top floor of the Unit II main building.

The annunciator panel for displaying and alarms, temperature, relative humidity and differential pressure of Quarantine, Raw Material store, PM-Foil Store, Intermediate Store clean corridor was located at the AHU control area. The alarms were recorded by the building management staff in the logbook BB 1387/01

HVAC

Every production cubicle had its separate AHU module. The filters were regularly cleaned: prefilters weekly, fine filters monthly.

The controlled areas of the production were classified as Class “D”.

The AHUs were operated (switched on/off) as required by the production plan. The maintenance staff was responsible to operate the system based on the intimation form initiated by the production. The operation of the units was recorded in a logbook.

The initial and regular qualification of the areas was based on the following parameters: air velocity, air change, particles, air flow pattern, recovery, heap filter integrity, environmental microbiology monitoring, pressure difference, temperature, relative humidity.

The qualification documents and the recent records (trend) of Granulation II cubicle were discussed.

Purified water system

The water system was located at the technical area, top floor, Unit II main building and consisted of two parts:

- Potable water generation module
- Purified water generation module

The system was installed in 2016 and no structural change has happened since then. The validation of the system was completed

Laboratory premises

QC Laboratory was located in separate building and was common for Unit I (Beta-lactams) and Unit II.

Entrance to the Microbiological laboratory was from QC Laboratory (Wet laboratory room). Entrance was via two change rooms and buffer air lock. Two LAFs were provided: one for general product analysis, one for beta-lactam product analysis.

4. Laboratory control system

SOP "Sampling and testing of water", SOP 3 "Validation of Water Purification and Distribution system", Standard Test Procedure for Purified Water and PW trends for 2020 and 2021 were discussed.

Action and alert limits for Microbiological tests were specified and were established based on historical trends.

Trends for return loop, sampling point for 2020 and 2021 were discussed.
The incoming samples were registered in logbooks specific for analyte such as cleaning validation, finished product and raw materials.

The analytical test records of the last Praziquantel FP were discussed. The ID of the reference material used was traceable. The working standards, used for routine testing were qualified against compendial standard.

The Albendazole and Praziquantel working standards were stored in 2-8 ^{0}C. The inventory of stocking, usage and maintenance of reference materials was available.

According to the SOP on the maintenance of Control Samples tablets were withdrawn from every finished product batch and kept in the control material store. The control materials of Albendazole and Praziquantel validation batches and the last Praziquantel batch were available.

The first on-going stability study was initiated with the first commercial batch manufactured in a calendar year.

There were 4 stability chambers in place:

- QC 118 standby, calibrated and qualified for all the stability parameters
- QC 117 40 ^{0}C ± 2 /75% ± 5
- QC 116 30 ^{0}C ± 2 /75% ± 5
- QC 115 25 ^{0}C ± 2 /60% ± 5

The storage and maintenance of the stability samples was recorded in the Stability Sample Master Schedule. The operating parameters (temperature, humidity and alarm, door opening) of the chambers were recorded by a software, the data together with the audit trail were printed out daily.

Documents discussed

- Praziquantel finished product analysis report & COA
- Praziquantel finished product Specification
- Handling and maintenance of analytical standards & Logs
- Praziquantel working standards
- Working standard consumption record
- Working standard Register
- Maintenance of control sample
- Praziquantel specification
- SOP "Out of Specification"
- SOP "Out of Trend Investigation"
- SOP "Handling of Laboratory Deviations"
- SOP "Good Chromatographic Procedures"
- SOP "Bracketing of Standards in Chromatographic Methods"
- SOP "Electronic Data Management in the Laboratory"
- SOP "HPLC and Column Management"

Contract Laboratories

A number of contract laboratories were used. SOP "Technical agreement with public laboratory", list of approved contract laboratories was discussed. Technical agreement with contract laboratory was discussed.Contract giver and acceptor responsibilities were clearly specified

Microbiological laboratory

SOP "Media Preparation" and Soyabean Casein Digest Agar (SCDA) Batch No XX, dry SCDA Batch number YY were discussed. Media preparation registers were media specific. Media preparation was well recorded and traceable to dry media and instruments used. Autoclave usage log book was discussed. Growth promotion test (GPT) for dry SCDA Batch number YY was discussed. Autoclave validation was performed by contractor annually.

SOP "Maintenance of culture" was discussed.

5. Materials system

Incoming materials and finished products were quarantined after receipt or processing, until they were released for use or distribution. Procedures were in place to ensure the identity of the contents of each container of starting material. Bulk containers from which samples have been drawn were identified. All products and packaging materials to be used were discussed on delivery. An identity test was conducted on a sample from each container of starting material.

The temperature was controlled (below 25 ^{0}C) and recorded in a logbooks 3 times daily. In case of temperature deviation in the main building storages, sound alert was generated in the utility area under 24x7 surveillance.

Sampling of starting materials and primary packaging materials was carried out in sampling room under RLAF. Dispensing of Starting materials and Primary Packaging Materials was carried out in two dispensing rooms under RLAF.

The transportation of the finished goods was validated for 24 feet container with cooling capability. According to the recent practice, 2 pcs of calibrated one-way data loggers (type USRIC-4) were used per shipment. It is the recipient who read out the graph and raise a complaint in case of temperature deviation.

The following documents were discussed:

- SOP "Procurement of Raw and Packaging Materials"
- SOP "Receipt and Handling of Raw and packing material"
- SOP "Sampling of Raw Materials". SOP was applicable to active pharmaceutical ingredients and excipients. According to the SOP not more than 10 individual samples should be combined for composite sample
- SOP "Sampling of Packaging materials". SOP was applicable for primary, secondary and tertiary packaging materials. Sampling was carried out according to the AQL.
- SOP "Testing and Release / Rejection of packaging materials". Defects were classified "critical", "major" and "minor"
- SOP "Temperature Mapping". SOP was applicable to Raw and Packaging materials store, Intermediate Storage area, Finished goods store, Control sample room, Stability/Humidity chambers, Incubators and Hot air Oven
- T and RH Mapping Protocol/Report (approved Raw Materials store)

6. Packaging and labelling system

During inspection manual packaging operations were not carried out. Information below was gathered from SOPs and verbal explanation.

SOP "Packaging of bulk product" and SOP "Procedures for Bulk Packing" were discussed. Exact number of bulk tablets in container was ensured by setting the weight of the product in balance with respect to average weight/number of units.

Part 3	**Inspection outcome**

Based on the areas inspected, the people met and the documents discussed, and considering the findings of the inspection, including the observations listed in the Inspection Report ***Medopharm Private Limited, Unit II, located at No. 50, Kayarambedu Village, Guduvanchery - 603 202, Tamilnadu, India*** was considered to be operations at accepeable level of WHO good manufacturing practices for pharmaceutical products guidelines.

All the non-compliances observed during the inspection that were listed in the full report as well as those reflected in the WHOPIR, were addressed by the manufacturer, to a satisfactory level, prior to the publication of the WHOPIR

This WHOPIR will remain valid for 3 years, provided that the outcome of any inspection conducted during this period is positive.

Part 4	List of GMP Guidelines referenced in the inspection report

1. WHO good manufacturing practices for pharmaceutical products: main principles. WHO Expert Committee on Specifications for Pharmaceutical Preparations. Forty-eighth Report Geneva, World Health Organization, 2014 (WHO Technical Report Series, No. 986), Annex 2. ***Short name: WHO TRS No. 986, Annex 2***
   http://www.who.int/medicines/areas/quality_safety/quality_assurance/expert_committee/trs_986/en/

2. WHO good manufacturing practices for active pharmaceutical ingredients. WHO Expert Committee on Specifications for Pharmaceutical Preparations. Forty-fourth Report. Geneva, World Health Organization, 2010 (WHO Technical Report Series, No. 957), Annex 2. ***Short name: WHO TRS No. 957, Annex 2***
   http://www.who.int/medicines/publications/44threport/en/

3. WHO guidelines for sampling of pharmaceutical products and related materials. WHO Expert Committee on Specifications for Pharmaceutical Preparations. Thirty-ninth Report. Geneva, World Health Organization, 2005 (WHO Technical Report Series, No. 929), Annex 4.
   Short name: WHO TRS No. 929, Annex 4
   http://whqlibdoc.who.int/trs/WHO_TRS_929_eng.pdf?ua=1

4. Supplementary guidelines on good manufacturing practices: validation. WHO Expert Committee on Specifications for Pharmaceutical Preparations. Fortieth Report. Geneva, World Health Organization, 2006 (WHO Technical Report Series, No. 937), Annex 4. ***Short name: WHO TRS No. 937, Annex 4***
   http://whqlibdoc.who.int/trs/WHO_TRS_937_eng.pdf?ua=1

5. General guidelines for the establishment maintenance and distribution of chemical reference substances. WHO Expert Committee on Specifications for Pharmaceutical Preparations. Forty-first Report Geneva, World Health Organization 2007 (WHO Technical Report Series, No.943) Annex 3. ***Short name: WHO TRS No. 943, Annex 3***
   http://whqlibdoc.who.int/trs/WHO_TRS_943_eng.pdf?ua=1

6. WHO Good Practices for Pharmaceutical Quality Control Laboratories. WHO Expert Committee on Specifications for Pharmaceutical Preparations. Forty-fourth Report. Geneva, World Health Organization, 2010 (WHO Technical Report Series, No. 957, Annex 1. ***Short name: WHO TRS No. 957, Annex 1***
   http://www.who.int/medicines/publications/44threport/en/

7. WHO Good Practices for Pharmaceutical Products Containing Hazardous Substances. WHO Expert Committee on Specifications for Pharmaceutical Preparations. Forty-fourth Report. Geneva, World Health Organization, 2010 (WHO Technical Report Series, No. 957), Annex 3. ***Short name: WHO TRS No. 957, Annex 3***
   http://www.who.int/medicines/publications/44threport/en/

8. WHO good manufacturing practices for sterile pharmaceutical products. WHO Expert Committee on Specifications for Pharmaceutical Preparations. Forty-fifth Report Geneva, World Health Organization, 2011 (WHO Technical Report Series, No. 961), Annex 6. ***Short name: WHO TRS No. 961, Annex 6***
   http://whqlibdoc.who.int/trs/WHO_TRS_961_eng.pdf?ua=1

9. WHO guidelines on transfer of technology in pharmaceutical manufacturing WHO Expert Committee on Specifications for Pharmaceutical Preparations. Forty-fifth Report Geneva, World Health Organization, 2011 (WHO Technical Report Series, No. 961), Annex 7. ***Short name: WHO TRS No. 961, Annex 7***
http://whqlibdoc.who.int/trs/WHO_TRS_961_eng.pdf?ua=1

10. Model guidance for the storage and transport of time-and temperature-sensitive pharmaceutical products. WHO Expert Committee on Specifications for Pharmaceutical Preparations. Forty-fifth Report Geneva, World Health Organization, 2011 (WHO Technical Report Series, No. 961), Annex 9. ***Short name: WHO TRS No. 961, Annex 9***
http://whqlibdoc.who.int/trs/WHO_TRS_961_eng.pdf?ua=1

11. WHO good practices for pharmaceutical microbiology laboratories. WHO Expert Committee on Specifications for Pharmaceutical Preparations. Forty-fifth Report Geneva, World Health Organization, 2011 (WHO Technical Report Series, No. 961), Annex 2. ***Short name: WHO TRS No. 961, Annex 2***
http://whqlibdoc.who.int/trs/WHO_TRS_961_eng.pdf?ua=1

12. WHO guidelines for drafting a site master file. WHO Expert Committee on Specifications for Pharmaceutical Preparations. Forty-fifth Report Geneva, World Health Organization, 2011 (WHO Technical Report Series, No. 961), Annex 14. ***Short name: WHO TRS No. 961, Annex 14***
http://whqlibdoc.who.int/trs/WHO_TRS_961_eng.pdf?ua=1

13. WHO guidelines on quality risk management. WHO Expert Committee on Specifications for Pharmaceutical Preparations. Forty-seventh Report Geneva, World Health Organization, 2013 (WHO Technical Report Series, No. 981), Annex 2. ***Short name: WHO TRS No. 981, Annex 2***
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