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Prequalification Team Inspection services
WHO PUBLIC INSPECTION REPORT
of the FPP manufacturer

Part 1	**General information**
Manufacturers Details	
Company information	
Name of manufacturer and address	**PT. SANBE FARMA Sterile Preparations Plant** Jl. Industri Cimareme No.8 Block A, Bandung Barat – 40553 Bandung Indonesia. Telephone number +62 22686 7966 Fax number +62 686 7969
Corporate address of manufacturer	PT. SANBE FARMA Jl. Taman Sari No. 10 Bandung 40116 Indonesia Telephone number +62 22420 7725 Fax number +62 22423 8476
Inspected site	
Address of inspected manufacturing site if different from that given above	As above
Unit	Unit III
Block	A
Line	Corima ampoule line (Room 66)
Manufacturing license number	Manufacturing license from the National Agency for Drug and Food Control (NADFC) Republic of Indonesia: License no.: HK.07.IF/V/402/14 Date of issue: 26 September 2014 Valid until: No expiry date
Inspection details	
Dates of inspection	14-16 May 2018
Type of inspection	Routine
Introduction	
Brief summary of the manufacturing activities	PT. SANBE FARMA Sterile Preparations Plant , manufactures and controls sterile products in the following dosage forms: Small and large volume parenterals including infusions, liquid injections, dry powders for injection, eye drops, ear drops, eye ointments, and fat emulsions

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	The company produces no highly toxic or hazardous products in Unit IIIA. *Oxytocin* is the most potent of materials handled. The site includes a separate and dedicated building for the handling of high potency cytotoxic products.
General information about the company and site	PT SANBE FARMA, Unit III, located in Cimareme, Padalarang, Bandung, Indonesia, is a facility dedicated to production of non-beta-lactam injectable products within the PT Sanbe Farma group. The factory is situated at J Jl. Industri No 8 Komp, Cimareme Desa Cimareme, Padalarang, Bandung. Adjoins to the site is the sister company, PT Caprifarmindo responsible for R&D within the Sanbe Group. PT Sanbe Unit III-A is involved in the manufacture of Small Volume Parenteral (SVPs) and Large Volume Parenteral (LVPs – plastic bag packaging. The site houses separate areas for SVPs and LVPs manufacturing. The SVP area has separate facilities for aseptically prepared formulations, aseptic ampoules and vials filling and eye drop filling as well as an extensive facilities for LVP terminally sterilized products. In addition a separate and dedicated block houses the manufacturing of cytotoxic medicines and biological products. Each having its own management, facilities services and laboratories.
History	The site was inspected by WHO in November 2014 and February 2017. The site holds the following valid Good Manufacturing Practices Certificates: Certificate No.: Certificate No.: 5005/CPOB/A/VIII/17 Issued by: National Agency for Drug and Food Control Dosage form: Non-Betalactam Sterile Powder for Injection Date of issue: Sept 02, 2017 Valid until: Sept 01, 2022 Certificate No.: 4407 / CPOB / A / IV / 15 Issued by: National Agency for Drug and Food Control Dosage form: Non-Betalactam Sterile Eye Ointment Date of issue: April 29, 2015 Valid until: April 02, 2019 Certificate No.: 4542 / CPOB / A / IX / 15 Issued by: National Agency for Drug and Food Control Dosage form: Non-Betalactam Small Volume Injection Date of issue: Sep 25, 2015 Valid until: Sep 28, 2020

	Certificate No.: 4543 / CPOB / A / IX / 15 Issued by: National Agency for Drug and Food Control Dosage form: Non-betalactam Large Volume Injection Date of issue: Sep 25, 2015 Valid until: Sep 28, 2020 Certificate No.: 4696 / CPOB / A / II / 16 Issued by: National Agency for Drug and Food Control Dosage form: Non-Betalactam Sterile Drop Date of issue: February 05, 2016 Valid until: February 08, 2021 The key changes relevant to the production of oxytocin injection since previous WHO inspection: • Change of Room Specification for SVP Area • Change SOP Washing Jumpsuit Garment with Unimac Garment Washing Machine • Change Performance Qualification Protocol of Oven Fedegari • Change of Pure Steam Distribution P&ID • Change SOP Audit Trail in HLPC which use LC solution system • Displacement of cold storage and freezer being used for raw material from R.81 into R.140 • Change of Performance Qualification Protocol Autoclave Fedegari • Change BMR Santocyn Injection with Batch Size 80L • Change of Testing of Oxytocin's Raw Material • Addition of Dust Extraction in Weighing Room R. 31 • Installation of Lab Solution Software for Chromatography System • Change Camera System Brand from ACG to Cognex
Brief report of inspection activities undertaken	
Scope and limitations	
Areas inspected	See Part 2 below
Restrictions	Only documentation relating to Corima ampoule line (Room 66) was inspected.
Out of scope	• LVP terminally sterilized (TS) products • SVP terminally sterilized (TS) products (there was a second ampoule line used for TS ampoules). • SVP aseptic powder filling • Aseptic eye drop manufacture

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WHO product numbers covered by the inspection	Prequalified reproductive health product, sterile.

Abbreviations

AHU	air handling unit
ALCOA	attributable, legible, contemporaneous, original and accurate
AQL	Acceptance quality limit
API	active pharmaceutical ingredient
APQR	annual product quality review
BDL	below detection limit
BMR	batch manufacturing record
BPR	batch packaging record
CAPA	corrective actions and preventive actions
CC	change control
CFU	colony-forming unit
CoA	certificate of analysis
CpK	process capability index
DQ	design qualification
EM	environmental monitoring
FAT	factory acceptance test
FBD	fluid bed dryer
FG	finished goods
FMEA	failure modes and effects analysis
FPP	finished pharmaceutical product
FTA	fault tree analysis
FTIR	Fourier transform infrared spectrometer
GC	gas chromatograph
GMP	good manufacturing practice
HACCP	hazard analysis and critical control points
HPLC	high-performance liquid chromatograph
HVAC	heating, ventilation and air conditioning
ID	identity
IR	infrared spectrophotometer
IPC	In process control
IQ	installation qualification
KF	Karl Fisher
LAF	laminar air flow
LIMS	laboratory information management system
LoD	limit of detection
LOD	loss on drying
MB	microbiology
MBL	microbiology laboratory
MF	master formulae
MR	management review
NIR	near-infrared spectroscopy

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NMR	nuclear magnetic resonance spectroscopy
NRA	national regulatory agency
OQ	operational qualification
PHA	preliminary hazard analysis
PM	preventive maintenance
PpK	process performance index
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
RH	relative humidity
RM	raw materials
RS	reference standard
SAP	system applications products for data processing
SFG	semi-finished goods
SOP	standard operating procedure
STP	standard test procedure
T	temperature
TAMC	total aerobic microbial count
TFC	total fungal count
TLC	thin layer chromatography
TMC	total microbial count
TOC	Total organic carbon
URS	user requirements specifications
UV	ultraviolet-visible spectrophotometer
VMP	Validation Master Plan
WFI	water for injection
WS	working standard

Part 2	**Brief summary of the findings and comments**

The inspection focused on the evaluation, verification and implementation of Corrective and Preventive actions following from the previous WHO inspection conducted in February 2017. The inspection was limited to the review and cross-checking of documents as per the company's CAPAs. WHOPIR is based on two inspection reports: February 2017 and May 2018.

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1. Pharmaceutical quality system (PQS)

Principle

Production and control operations were specified in written form and GMP requirements were generally followed. Managerial responsibilities were specified in job-descriptions. Product and processes were monitored with the results taken into account at batch release. Product quality reviews of the pharmaceutical products were conducted annually.

Quality Risk Management

The SOP "Quality Risk Management" was briefly discussed. Risk assessment followed the standard approaches described in ICH Q9 and met the general requirements of WHO GMP norms and standards:

- Risk identification
- Risk analysis
- Risk evaluation
- Risk control
- Risk acceptance
- Risk communication
- Risk review

The company's main approach to risk assessment followed a unified system based upon FMEA (Failure modes and effects analysis). It was noted that the training materials and model procedures issued by BPOM/NADFC followed this approach and it would appear that BPOM/NADFC guidance was in part strongly influenced the company rather narrow implementation of the single tool. Currently the company experience of the routine implementation and use of formal QRM was still relatively early in the QMS life cycle. A good start had been made but as the company's expertise grows so should its sophistication in choice of tool according to circumstances.

In the FMEA approach scores from 1- 4 was used for individual elements of the Risk Priority Number (RPN) calculation:

- 1-8 Minor
- 9-27 Major
- 28-64 Critical

Risk register was prepared annually.

Risk Identification

The SOP "Risk I identification" was briefly discussed. It dealt with Deviation reporting and risk classification (RPN).

Product Quality Review (PQR)

The SOP "Product Quality Review" was briefly discussed. The PQR schedule for 2017 was presented to the inspectors. Prequalified product PQR for 2017 was finalized on 29/03/2018. The PQR was broadly comprehensive and acceptable covering most of the requirements of WHO GMP.

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A single common PQR was prepared for all market variant products made according to the same base manufacturing process.

Statistical tools were used for data presentation and analysis. Process capability was calculated using Cpk:

Value of Cpk	Capability
Cpk <1.0	Process statistically not capable, need investigation and need improvement
1.0≥1.33	Process statistically capable, need improvement
Cpk≥1.33	Process statistically very capable

PQR for prequalified product was briefly discussed

A new SOP was implemented: "Data Methods and Statistical Tools" that provided for the reasoning of the required needs based on Cpk results.

Management review (MR)

The SOP "Management review" was briefly discussed. According to the SOP quality system review shall be performed depending on a defined level. Three levels are defined with level 1 requiring review every 2 months, Level 2 every 4 months and Level 3 every 6 months addressing matters relating to:

- Follow-up action's from pervious reviews
- Process performance and product conformity
- CAPAs
- Customer feedback and complaints
- Internal quality audits
- Changes and quality system planning
- Recommendations for improvements
- External assessments such as regulatory inspections and customer audits

Level 3 required feedback from managers etc. on the above-mentioned points. Minutes from the meeting of XX was briefly discussed.

Deviations

The SOP "Deviation report" and flow chart were briefly discussed. The SOP was applicable to unplanned deviations. Deviations and their target close out, were classified with the system based on risk assessment and their score of risk priority numbers:

- Critical – should be closed in 7 working days
- Major - 14 working days
- Minor – 21 working days

Ishikawa diagrams were used for root cause analysis.

QA identified the category of deviation based on:

- Risk calculation (RNP)

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Deviations were trended.

A number of deviation investigation reports were briefly discussed.

Corrective actions and preventive action (CAPA)
The company has a unified CAPA SOP which was used to handle most CAPA arising from several reporting mechanisms. CAPAs related to the self-inspection were presented separately and were linked to the specific self-inspection.

The SOP "Corrective actions and preventive actions" was briefly discussed together with the log and specific examples chosen by the inspectors. CAPAs were proposed by manager or supervisor of each department and the QA manager was responsible for reviewing and approving CAPAs prior to their implementation. CAPAs registers were produced month wise.

Change control (CC)
The SOP "Change management" and its flow chart were briefly discussed. The SOP was applicable for any GMP related changes.

Changes were classified according to assessed risk as:
- Level (I) requiring final approval by only the QA manager
- Level (II) approved by the Head of Quality

CC registers were maintained department wise by QA.

A number of CCs were briefly discussed.

2. Good manufacturing practices for pharmaceutical products
Manufacturing processes were defined and briefly discussed. Qualifications and validations were seen to be performed according to prepared protocols. Significant deviations from the initial protocol were recorded and investigated, root causes were determined and CAPAs were implemented where necessary. Systems were in place for handling complaints and recalling any batch of product from sale or supply.

3. Sanitation and hygiene *(covered during previous inspection)*
The company had an SOP as the basis for its approach to personal hygiene and sanitation in its production facilities. Microbial monitoring of clean room personnel was performed as part of routine batch control.

Generally, the facilities were noted to be clean and well organized during the inspection.

4. Qualification and validation
Aseptic process validation
The SOP "Aseptic process validation and Aseptic process media fill process line" was briefly discussed together with the validation protocol /report (Media fill run) XX. Target was 0, but in case of deviation, an investigation should be performed.

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The most recent media fill report was briefly discussed.

The document "Justification to define mimic process of ampoule line products for aseptic process validation (Media fill run)" was briefly discussed. The inspectors were generally satisfied that the media simulation was sufficiently representative of routine production. Worst case conditions were reflected as routine and non-routine interventions. The interventions (time and action) were not clearly recorded.

Authorization records of staff working in Grade B (filling area) were briefly discussed. The training records of Mr XX, operator, were briefly discussed.

Autoclave validation *(covered during previous inspection)*
The new autoclave adjoining the aseptic ampoule line for garments and spare parts sterilization was installed in October 2015. IQ&OP protocol/reports were available. Autoclave re-qualification protocol XX and report YY were discussed. The Bowie Dick test was performed once per day for the garments load.

Depyrogenation oven qualification *(covered during previous inspection)*
Depyrogenation oven IQ&OQ was finished 18 January 2016. IQ&OQ protocol XX and report YY were briefly discussed. Hot air oven qualification report XX was also spot checked. Validation included heat penetration factor (FH) calculations and a 3 log endotoxin spike verification.

Cleaning validation
26 products were manufactured on Corima line No 66. Cleaning validation report/protocol was briefly discussed.

LabSolution Qualification
Software installation of the new software program, *LabSolution* was finalized in March 2018 as per User specifications. DQ, OQ, PQ protocols/reports were available.

Clean room qualification *(covered during previous inspection)*
Performance qualification report XX of AHU supplying air to Corima line was briefly discussed.

HVAC system was equipped with alarms, which were said to be routinely challenged. Disinfectants used for rooms cleaning were rotated every two weeks.

Temperature mapping *(covered during previous inspection)*
The SOP "Temperature and humidity mapping of controlled storage area" was briefly discussed.

Temperature mapping protocol "Pre-mapping temperature and relative humidity protocol" XX and report "Pre-mapping temperature and relative humidity protocol" YY were briefly discussed.

Leak test validation *(covered during previous inspection)*
Prequalified product was filled into glass 2 mL ampoules. Validation of the leak test had been performed in autoclave by vacuum. Validation report XX "Autoclave YY for leak test" was briefly discussed.

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5. Complaints

The SOP "Product complaint handling" was briefly discussed. Complaints were classified regarding product quality:

- Critical
- Major
- Other

All complaints were received by the Marketing Department with safety and efficacy complaints attended to be Marketing and or the Pharmacovigilance Units per written procedure. Quality complaints were handled by QA. Complaints register for Unit III 2017 and 2018 was presented to the inspectors. Monthly-wise registers were used. Complaints were trended yearly with the 2017 trends presented to the inspectors.

A number of complaints were briefly discussed.

6. Product recalls *(covered during previous inspection)*

The SOP "Product recall" was discussed. Recalls were classified as per BPOM/NADFC guidelines:

- Grade I - recall within 24 hours
- Grade II – recall within 5 days
- Grade III – recall within 7 days

The QA manager was responsible for dealing with recalls. The head of quality had overall responsibility for dealing with recalls.

Recall effectiveness was periodically evaluated by mock recall. If there was not real recall, mock recall should be performed every 2 years.

7. Contract production, analysis and other activities *(covered during previous inspection)*

Manufacturing operations and laboratory testing relating to oxytocin were not contracted out. Pest control activities and irradiation of eye drop bottles and components were contracted out.

8. Self-inspection, quality audits and suppliers' audits and approval

The SOP QAS-NS/SOP/LS/020/00 "Audit" was briefly discussed. Inspection was carried out by a nominated self-inspection team using an audit check lists. Inspection report was written by the team and CAPAs addressed by the inspected department.

Observations were classified as:

- Critical
- Major
- Minor

<u>Suppliers' audits and approval:</u>

The SOP Manufacturing operations and laboratory testing relating to oxytocin were not contracted out. Pest control activities and irradiation of eye drop bottles and components were contracted out.

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The SOP "Vendor approval of new supplier for raw material" was briefly discussed.
Following approval as a vendor the suppliers were monitored as per SOP "Monitoring of Supplier". There was only one supplier of API.

9. Personnel

There appeared to be an adequate number of personnel qualified to perform and supervise the manufacturing and quality control operations. Controls were in place to prevent unauthorized people from entering production, storage and QC areas.

Number of personnel involved in company activities was 967.

The SOP "Personnel qualification for manual visual inspection" was briefly discussed. Ampoules visual inspection was performed manually and automated. According to the company policy operators should be under 40 years old; with eye checks to be done by an eye doctor every 6 month. The same rules were applied for the QA personnel who supervised visual inspection and performed AQL sample inspection. The SOP stated that visual inspectors should have a brake after 1 hour and in one day should not do visual inspection for more than a total of 4 hours. Operators were qualified against "standard ampoule test". Operators were re-qualified once a year. Ampoules rejected by the machine was not reintroduced on the line or visually re inspected.

Preparation for specimen for visual inspector's qualification was briefly discussed. Annually new test kits were made.

10. Training

Training was provided in accordance with a written training programme.

The "Training" was briefly discussed. There were the following training modes in place:

- General orientation
- On the job training
- SOP training
- Outside training and seminars

Training effectiveness was evaluated by verbal questions, open questions and written answers.

The training SOP for "Visual inspection" was briefly discussed.

Mr XX operator, filling line training records were verified. Continuous training plan was annually identified based on a needs analysis. Training effectiveness was evaluated– by written questionnaire and classroom discussions.

Personal training files were maintained by HR department.

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11. Personal hygiene *(covered during previous inspection)*
All personnel, prior to and during employment, had to undergo an initial health examination. Thereafter regular health examinations were carried out every year. Personnel conducting visual inspections had to undergo periodic eye examinations every six months. Direct contact between the operator's hands and starting materials, primary packaging materials and intermediate or bulk products was avoided. Smoking, eating, drinking, chewing, and keeping plants, food, drink; smoking material and personal medicines was prohibited in production, laboratory and storage areas.

12. Premises *(covered during previous inspection)*
Ancillary areas
Rest and refreshment rooms were separate from manufacturing and control areas.

Production areas
Exposed surfaces were smooth, impervious and unbroken. Changing rooms were designed as airlocks and used to provide physical separation of the different stages of changing. Changing rooms were flushed with filtered air. Premises were cleaned and disinfected according to written procedures.

Quality control areas
Sufficient space was given to avoid mix ups and cross-contamination. Storage space was provided for samples, reference standards, solvents, reagents and records.

13. Equipment *(covered during previous inspection)*
Fixed pipework was labelled to indicate the contents and the direction of flow. Balances and other measuring equipment of an appropriate range and precision were available for production and control operations and were calibrated on a scheduled basis.

14. Materials *(covered during previous inspection)*
Materials were received, sampled and tested according to the written procedures.

15. Documentation
Documents were available and included SOPs, protocols and records. SOPs briefly discussed in the production areas were generally being followed and staff appeared appropriately knowledgeable as to their content.

16. Good practices in production *(covered during previous inspection)*
In general production operations followed defined procedures. Deviations from procedures were recorded and investigated. Access to production premises was restricted to authorized personnel.

Prequalified product was manufactured on a Corima ampoule line. This was the only line used by the company for aseptic filing of aseptically manufactured ampoules. The company had two other lines for terminally sterilized ampoules; however, these were not within the scope of inspection.

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Secondary packaging rooms were spacious and lines well segregated.

17. Good practices in quality control *(covered during previous inspection)*

The QC function was independent from other departments. Adequate resources were available to ensure that all the QC arrangements were carried out in a timely and ordered fashion. QC personnel had access to production areas for sampling and investigations as appropriate.

The SOP "Preparing and reviewing QC analytical report" was briefly discussed.

The SOP "Sampling for analysis of starting material" was briefly discussed. According to the SOP starting materials samples were taken from every container and 100 % identity tests were performed.

The SOP "Packaging material sampling" was briefly discussed. AQL, inspection level II, was used for ampoule sampling. Defects were classified as:

- Critical (AQL level 0,01)
- Major (AQL level 0.1, 0.25, 0.4 and 1.0)
- Minor (AQL level 2.5, 4.0 and 6.5)

Stability testing

One batch per year was placed for on-going stability studies.

Environmental monitoring of clean area (EM)

The SOP "Environmental monitoring in aseptic room using microbiological method" was briefly discussed. Swab samples, air samples and settle plates were used for EM. Alert and action limits for the results of particulates and microbiological monitoring were defined and monthly trends of environmental monitoring were in place.

Monitoring of PW and WFI

The SOP "Water quality routine monitoring" was briefly discussed. Alert limits were established 60 % from the specification. Sampling plan for drinking water, PW and WFI were in place. WFI critical sampling points at the return loop and storage tanks (SVP and LVP) were sampled and tested daily for endotoxins, conductivity and TOC.

Reference materials

The SOP "Reference standard and working standard" was briefly discussed. Pharmacopoeia reference standard was used for Oxytocin impurity tests and a working standard for the assay test.Working standards were prepared and dispensed by the R&D department in 12 amber glass vials. After opening each vial was required to be used within one month. Usage of reference materials were recorded in a log book. Oxytocin reference materials were stored in the refrigerator at 2 – 8 ºC. T in the refrigerator was continuously recorded on charts. Charts were reviewed once per week. Temperature was controlled manually three times per day.

Stability studies
The SOP "Stability testing" was briefly discussed. Stability chambers Temperature and RH sensors were connected to the software and recorded continuously. Temperatures were checked manually three times per day. The chambers were equipped with a local sound alarm.

Retention samples
Finished product and APIs retention samples were stored in refrigerator at 2 – 8 ºC. T in the refrigerator was continuously recorded. T in the refrigerator was continuously recorded on charts. Charts were reviewed once per week. T was controlled manually three times per day.

Storage period for finished product was expiry date + 1 year and for APIs was 2 years after finished product release.

Microbiology laboratory
Laboratory premises had separate rooms for positive controls, sterility tests, bioburden tests, media preparation and sterilization.

Out of specification results (OOS)
The SOP was applicable for all investigation of OOS results of raw materials (APIs), excipients, packaging materials, and finished products obtained in QC laboratory as well as in stability studies. This procedure was also applicable for microbiological OOS tests and sterility failure. It did not cover IPC activities in production.

A new SOP relating to Laboratory Incidents was introduced.

The SOP "Out of trend" was briefly discussed. According to the SOP tolerance interval of OOT is determined by average of each critical parameter ± (3xSD) for upper and under limits,

There were different OOS registers for the chemical and microbiological labs. Registers were maintained on a month-wise basis.

PART 3
Based on the areas inspected, the people met and the documents reviewed, and considering the findings of the inspection, including the observations listed in the Inspection Report, **PT. SANBE FARMA Sterile Preparation Plant (Unit III, Building A, Corima ampoule line) located at Jl. Industri Cimareme No.8, Desa Cimareme, Kecamatan Ngamprah, Kabupaten Bandung Barat – 40553, Indonesia** was considered to be operating at an acceptable level of compliance with WHO good manufacturing practices for pharmaceutical products.

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.

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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 used for assessing compliance

1. 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

2. 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.
   http://www.who.int/medicines/areas/quality_safety/quality_assurance/expert_committee/trs_986/en/
   Short name: WHO TRS No. 986, Annex 2

3. WHO Good Manufacturing Practices: water for pharmaceutical use. WHO Expert Committee on Specifications for Pharmaceutical Preparations. Fourth-sixth Report. Geneva, World Health Organization, 2012 (WHO Technical Report Series, No. 970), Annex 2
   Short name: WHO TRS No. 970, Annex 2
   http://www.who.int/medicines/areas/quality_safety/quality_assurance/expert_committee/trs_970/en/

4. 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

5. WHO guidelines on good manufacturing practices for heating, ventilation and air-conditioning systems for non-sterile pharmaceutical dosage forms. WHO Expert Committee on Specifications for Pharmaceutical Preparations. Forty-fifth Report Geneva, World Health Organization, 2011 (WHO Technical Report Series, No. 961), Annex 5
   Short name: WHO TRS No. 961, Annex 5
   http://whqlibdoc.who.int/trs/WHO_TRS_961_eng.pdf?ua=1

6. 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

7. WHO Good Practices for Pharmaceutical 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/

8. 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 2
Short name: WHO TRS No. 957, Annex 2
http://www.who.int/medicines/publications/44threport/en/

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. 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

12. 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

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
http://www.who.int/medicines/areas/quality_safety/quality_assurance/expert_committee/trs_981/en/

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14. 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

15. WHO General guidance on hold-time studies WHO Expert Committee on Specifications for Pharmaceutical Preparations. Forty-ninth Report Geneva, World Health Organization, 2015 (WHO Technical Report Series, No. 992), Annex 4
Short name: WHO TRS No. 992, Annex 4
http://www.who.int/medicines/areas/quality_safety/quality_assurance/expert_committee/WHO_TRS_992_web.pdf

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