EDA GMP public inspection report

Part 1	***General information***
Manufacturers details	
Company information	
Name of manufacturer	*VACSERA, EGYVAC – Building 2*
Inspected site	
Address of inspected manufacturing site	*51 Wezaret El-Zeraa Street, El-Agouza, Giza, Egypt* *Telephone number: + 202 37611111* *Fax: + 202 37611111-1130* *Email address: egyvac.regulatoryaffairs@vacsera.com*
Inspection details	
Dates of inspection	*From 09 to 10 November 2025*
Type of inspection	*Follow-up inspection to ensure the implementation of CAPA submitted in-response to inspection conducted in 04/2025*
Introduction	
General information about the company and site	*Building #2 (B#2) is one of the manufacturing lines belonging to Egyptian Company for Production of Sera, Vaccines and Drugs (EGYVAC) which is one of VACSERA, Holding Company for biological products and Vaccines subsidiary companies. Authorized products for B#2, on campaign basis are Insulin, Purified Polyvalent Anti-scorpion serum (dry) and Rabies vaccine.*
Brief report of inspection activities undertaken	
Scope and limitations	
Areas inspected	*Production line of B#2, EGYVAC, VACSERA*
Restrictions	*None*
Out of scope	*- Animal house* *Packaging and labeling system*
Inspected biological product	*Insulin, Purified Polyvalent Anti-scorpion serum (dry) and Rabies vaccine*
Abbreviations	
AHU	*Air Handling Unit*
ALCOA	*Attributable, Legible, Contemporaneous, Original and Accurate*
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*
CPP	*Critical Process Parameter*
CQA	*Critical Quality Attribute*
DQ	

EM	*Design Qualification*
FAT	*Environmental Monitoring*
FBD	*Factory Acceptance Test*
FMEA	*Fluid Bed Dryer*
FPP	*Failure Modes and Effects Analysis*
FTA	*Finished Pharmaceutical Product*
FTIR	*Fault Tree Analysis*
GC	*Fourier Transform Infrared Spectrometer*
GMP	*Gas Chromatograph*
HACCP	*Good Manufacturing Practice*
HPLC	*Hazard Analysis and Critical Control Points*
HVAC	*High-Performance Liquid Chromatograph*
IR	*Heating, Ventilation and Air Conditioning*
IQ	*Infrared Spectrophotometer*
KF	*Installation Qualification*
LAF	*Karl Fisher*
LIMS	*Laminar Air Flow*
LoD	*Laboratory Information Management System*
LOD	*Limit of Detection*
MB	*Loss on Drying*
MBL	*Microbiology*
MF	*Microbiology Laboratory*
MR	*Master Formulae*
NMR	*Management Review*
NRA	*Nuclear Magnetic Resonance Spectroscopy*
OQ	*National Regulatory Agency*
PHA	*Operational Qualification*
PM	*Process Hazard Analysis*
PpK	*Preventive Maintenance*
PQ	*Process Performance Index*
PQR	*Performance Qualification*
PQS	*Product Quality Review*
QA	*Pharmaceutical Quality System*
QC	*Quality Assurance*
QCL	*Quality Control*
QRM	*Quality Control Laboratory*
RA	*Quality Risk Management*
RCA	*Risk Assessment*
SOP	*Root Cause Analysis*
TAMC	*Standard Operating Procedure*
TFC	*Total Aerobic Microbial Count*
TLC	*Total Fungi Count*
URS	*Thin Layer Chromatography*
UV	*User Requirements Specifications*
	Ultraviolet-Visible Spectrophotometer
Part 2	***Brief summary of the findings and comments***

1. Pharmaceutical Quality System

1.1 Management review

Quality management system assessment management procedure was found in-place and implemented to evaluate and monitor the product and process lifecycle. The meeting of review conducted periodically with top

management to review and evaluate all issues related to quality of produce product and effectiveness of implemented CAPA

1.2 Product quality review

APR SOP was in place describing the action that is taken to conduct annual product review, reviewed, and was found satisfactory. Up till now no APQR related to rabies vaccine was initiated as no batches produced during the previous year; but by the end of 2025, a new APQR related to rabies vaccine will be initiated including all details about produced batches during 2025.

1.3 Quality risk management

QRM in B#2 is the overall and continuing process of appropriately managing risks to product quality throughout the product's life cycle to optimize its benefit–risk balance. It is a systematic process for the assessment, control, communication and review of risks to the quality of the biological product. It can be applied both proactively and retrospectively.

SOP for personnel flow in B#2 was updated to add more precautions related to the performed activities and risk assessment related to this area was initiated and will be added to CCS. Quality risk assessment for use of old version of BMS in B#2 was initiated as a short action plan till upgrading of BMS which was planned to be finally installed in 02/2026.

Some deficiencies were raised in this section that have been adequately addressed and will be followed by the effectiveness of control measures which were taken in the upcoming inspections.

1.4 Deviation management

A review of the quality system confirmed that the company has an approved and implemented system for the management of deviations. The system is defined in the deviation SOP and describes the process for reporting, documenting, and monitoring deviations or unexpected events from established procedures or specifications across all EGYVAC departments, including the requirements for investigation, corrective actions, and prevention of recurrence.

1.5 Control change

The relevant Standard Operating Procedure (SOP) governing change control was reviewed. The SOP adequately defines the systematic process for the identification, evaluation, approval, implementation, and documentation of any proposed changes related to products, manufacturing processes, quality control systems, equipment, facilities, or controlled documents. In addition, the SOP provides a clear classification of changes based on their potential impact and outlines the responsibilities and requirements to ensure that changes are assessed, controlled, and implemented in compliance with applicable quality and regulatory standards.

1.6 Compaints

In accordance with the approved SOP titled "Complaint and Product Quality Defect Management Procedure", the procedure for receiving, evaluating, documenting, and managing complaints and product quality defect reports at the Regulatory Compliance Unit was reviewed. The SOP adequately defines the required actions to be taken upon receipt of any complaint or product quality defect. Review of records confirmed that no complaints or product quality defect reports were received during the past two years.

1.7 Product recall

The company has an established and approved system for the management of product recall. The SOP titled "Recall Procedure" was reviewed and found to adequately define the process for the identification, evaluation, freezing, and recall of products, as applicable. The procedure was considered satisfactory and appropriate to ensure effective control and timely execution of product

recall activities

1.8 Self-inspection and CAPA managment

The company has an established system for self-inspection and corrective and preventive action (CAPA) management. Self-inspection documentation was reviewed and found to adequately describe the internal auditing system covering all aspects of the facility to verify compliance with national regulations, applicable international guidelines, and internal policies. Internal audits are conducted in accordance with an approved annual audit plan and may also be performed on an unannounced basis when required. The effectiveness of the system is monitored and verified through review of internal audit reports and associated CAPA records.

1.9 Quality aduits and supplier's audit and approval

The company has an established system for the qualification, auditing, and approval of suppliers. Review of the system confirmed that all materials used comply with applicable pharmacopeial specifications, current Good Manufacturing Practice (cGMP) requirements, and other relevant pharmaceutical standards. Materials are sourced exclusively from suppliers qualified and approved by EGYVAC or recommended by licensors. In addition, raw materials are subject to quality control testing at the VACSERA Raw Material Quality Control Laboratory, where applicable, to verify conformity with approved specifications.

1.10 Personnel

Organization organogram

The company organizational chart was reviewed and was found to clearly define the organizational structure and reporting relationships for quality management, production operations, pharmacovigilance, information technology, human resources, procurement, finance, registration activities, global logistics, and international business. The chart also identifies job titles, assigned responsibilities, and designated responsible and qualified people.

During the inspection, an adequate number of personnel with appropriate qualifications and relevant practical experience were verified. Personnel were found to be aware of the GMP principles applicable to their roles, with documented evidence of both initial and ongoing GMP training.

Training and qualifications

Effective continuous training system was found in place. Also, on-job training was provided by qualified personnel in accordance with a written program for all personnel involved in the manufacture of biological. QA department was responsible for establishing on-job training program & policies and assuring the implementation of on-job training plans internally, and Human Resources division was responsible for organizing and implementation of the external training.

Personal hygiene

Different hygiene programs were established and adopted to different needs of the factory. Special garments are available for different classified areas with clearly illustrated instructions for their usage, e.g. in the formulation and filling area wear sterile garments with sterilized shoes and googles. In addition, Operator in the aseptic area were adequately behaving and followed the knowledge of sanitization so, Practices were found satisfactory.

1.11 Documentation

The documentation system was reviewed, and the required controlled documents were identified and found to be managed in accordance with approved SOPs.

Certain deficiencies were identified in this area; however, appropriate corrective actions have been implemented. The effectiveness of these actions will be verified during subsequent inspections

1.12 Batch release process

The batch release process was reviewed and found to be effectively controlled by Quality Assurance (QA). The process includes a comprehensive evaluation of the finished product, taking into account production conditions, in-process testing results, and compliance of production records with finished product specifications. Only when all relevant criteria are met and verified by QA is the finished product formally released.

2. Production

2.1 Drug substance

Incoming raw materials are immediately placed in a designated quarantine area upon receipt and labeled with a yellow "Quarantined" label in the VACSERA main store until testing is completed by the VACSERA Quality Control (QC) laboratory. Following release and receipt of a Certificate of Analysis (COA), raw materials are transferred to Building #2, labeled with a green release label, and stored under appropriate conditions. Dispensing and the initiation of drug substance (DS) production are conducted in accordance with approved and validated process flow charts specific to each product. These process flow charts were reviewed during the inspection and found to be satisfactory.

2.2 Fill and finishing operations

The production of drug products is conducted following validation of all production steps, with critical process parameters (CPPs) and critical quality attributes (CQAs) clearly defined and appropriately controlled.

Finished products are immediately placed in a designated quarantine area after processing. Quality Assurance (QA) collects representative samples, which are then tested by Quality Control (QC) to verify compliance with established specifications.

A review of batches of the rabies vaccine for human use, produced from May 2025 to the present and released by VACSERA QA, was conducted on a random basis. All reviewed batches were found to be following the validated operations and established procedures.

2.3 Visual inspection

The visual inspection of the rabies vaccine for human use is performed manually by qualified personnel. Training for all personnel involved in the visual inspection process has been conducted and documented to ensure competence in detecting product defects.

2.4 Process validation

Process validation is conducted to ensure that a specific manufacturing process consistently produces a product meeting its predetermined specifications. Verification of process validation is achieved through the successful completion of a minimum of three consecutive batches within established validation limits.

Once a process has been validated, any modifications or changes to the process or system are managed in accordance with the company's changing control procedures. As part of this procedure, an assessment is performed to determine whether revalidation is required.

A concurrent process validation study to produce lyophilized rabies vaccine (Vero cell) for human use was performed using three consecutive batches. During the review of this study, it was observed that the filling time increased compared to the media fill due to differences in stopper height and position. This deviation was documented for the first batch and recorded in the deviation report.

2.5 Reprocessing

The reprocessing approach Not applied of production site

2.6 Batch manufacturing record

Batch records, including all manufacturing steps, were reviewed in accordance with the applicable SOP. The review ensures compliance with approved written procedures and verifies that all

manufacturing steps and test results meet established specifications prior to batch release.
The SOP for batch release was reviewed and found adequate to ensure that batch records comply with regulatory authorizations, company policies, and GMP requirements. The batch release unit prepares a summary protocol to be submitted to the National Regulatory Authority for product release. No batch is released for distribution until the Release Certificate is received from the Egyptian Drug Authority (EDA)

3. Facilities and equipment system

3.1 Qualification and validation

A review of the system confirmed that the company has an established qualification and validation program, which includes initial qualification and periodic requalification, as well as requalification following any major changes.

For example, following the installation of the ORABS and weighing booth, requalification activities were performed. The following relevant documents were reviewed and found satisfactory:

- *Weighing Booth Operation Qualification Protocol*
- *LAF Performance Qualification for the filling machine in the sterile area*
- *LAF Performance Qualification Protocol for VACSERA Building #2*
- *LAF Performance Qualification for CAPP LAF/N. S in the crimping room*

These documents demonstrate that equipment and areas are qualified and maintained in accordance with the company's validation procedure.

3.2 Calibration

The company has an established calibration management system designed to ensure that all manufacturing and testing equipment is properly calibrated. The system includes preparation of an equipment inventory, development of an annual calibration plan, coordination with internal or external calibration laboratories for execution of calibration activities, and labeling of equipment with appropriate calibration status label

3.3 Maintenance

A review of the system confirmed that the company has an established periodic maintenance program, managed by the Engineering Department. This system ensures the proper execution of maintenance activities for all facility systems, utilities, and equipment, supporting consistent and reliable operation throughout the facility.

3.4 Water system

The water system, located in Building #2 at EGYVAC, is used for the production, storage, and distribution of Purified Water (PW), Water for Injection (WFI), and Clean Steam in compliance with applicable pharmacopeial standards and current Good Manufacturing Practices (cGMP).
The PW and WFI distribution systems are designed for automatic sanitization, with PW and WFI being sanitized by heating to 96°C and 98°C, respectively, using plant steam through the designated heaters (E70 & E15). Temperature monitoring of the heated jacket for the vent filter of the WFI storage tank has been installed, and vent filter integrity testing was performed before and after installation. A differential pressure gauge has been installed on the vent filter of the PW storage tank.

A review of the water treatment system and its monitoring procedures confirmed that the system is properly controlled and operating satisfactorily.

3.5 HVAC

Fresh air is supplied to the facility through a central Air Handling Unit (AHU). The system is of the re-circulated air type, providing a minimum volume of fresh air sufficient to compensate for building air leakage and maintain the required air changes per hour. Air in classified areas (Class B, C, and D) is re-circulated separately to prevent any possibility of cross-contamination. Air diffusion in

classified rooms is achieved through HEPA-filtered hoods to ensure the specified filtration efficiency and cleanliness class.
The deficiencies previously noted in this section have been addressed, and the effectiveness of these corrective actions will be verified during upcoming inspections.

3.6 Aseptic process simulation

A review of the system confirmed the existence of an approved procedure for aseptic process simulation (media fill). Media fills were conducted every six months in the absence of major process changes. The most recent media fill, performed in July 2025, simulated the full production time for the rabies vaccine and demonstrated zero contamination.

3.7 Cleaning validation

The cleaning validation study for dismountable equipment used in the production of rabies vaccine in Building #2, conducted in April 2023, was reviewed and found to be satisfactory in accordance with the cleaning verification protocol.

3.8 Storage equipment

The Good Distribution Practice (GDP) SOP, describing procedures for the storage, transport, and distribution of goods, was reviewed. It also defines the storage requirements for received materials under appropriate conditions to ensure compliance with GSP requirements.
An SOP for monitoring the temperatures of cold chain and hot rooms using temperature recorders is in place. This procedure ensures that vaccines are stored within the required temperature range in cold rooms, while intermediate materials are maintained at the appropriate temperature in hot rooms. Bulk materials are stored in warehouse cold rooms or medical freezers, and finished products are held in the quarantine cold room until batch release. Released batches are subsequently stored in the company's central cold rooms for final distribution. Product status is controlled through labeling, indicating quarantined, released, or rejected status.
Previously identified deficiencies in this area have been adequately addressed, and the effectiveness of corrective actions will be verified during upcoming inspections.

3.9 Computerized system

The computerized system ensures the integrity of electronic data. Access to the system and its information is restricted to authorized personnel, who are permitted to create, modify, or approve documents only through an approved change control procedure. Periodic backups of all electronic data are performed and securely stored on electronic media to prevent data loss and ensure traceability.

3.10 Environmental monitoring

The following SOPs were reviewed and found satisfactory:

- *SOP for Trend Analysis of Air Monitoring Data*
- *SOP for Trend Analysis of Water Monitoring Data*
- *SOP for Establishing Alert and Action Limits for Environmental Monitoring Results Based on Historical Data*

These procedures define the methodology for monitoring, analyzing, and interpreting environmental data to ensure compliance with established limits and maintain controlled condition

4. Laboratory control system

4.1Analytical method validation

Quality control (QC) is independently responsible for establishing, validating, and implementing all QC procedures, keeping the reference samples of material and products, monitoring the stability of the products, implementing environmental monitoring program for water system and viable particle count of air, personnel & surfaces and participating in the investigation of complaints related to the

quality of the product. For new test method, it should be appropriately validated and reviewed by Quality Assurance. The criteria should refer to pharmacopeia or special requirements of the client.

4.2 Out of specifications

SOP for method of reporting and monitoring deviations or unexpected events that occur in all the EGYVAC departments was reviewed and covered all aspects from established written procedures, or deviations from established specifications and the actions taken for investigation, correction and prevention of reoccurrence.

4.3 Reference standard

QC carries out testing against designed and approved specification and procedures. The specification and testing methods are referenced to pharmacopeia.

4.4 Animal house and testing facilities

Out of the scope

5. Material system

A review of the established system confirmed that SOPs are in place to govern the qualification and approval of suppliers, ensuring that materials supplied meet the company's quality requirements and contribute to the quality of the final product. However, a review of certain materials used in manufacturing indicated that these materials were neither included in the supplier evaluation program nor subjected to testing upon receipt.

6. Packaging and labeling system

Out of the scope

Part 3	***Inspection outcome***

- *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, (Production line of B#2, VACSERA) Located at (51 Wezaret El-Zeraa Street, El-Agouza, Giza, Egypt),* ***was considered to be operating at an acceptable level of compliance with WHO GMP guidelines as adopted by EDA for biological products.***
- *All the non-compliances observed during the inspection that were listed in the full report as well as those reflected in the EDA GMP public inspection report, were addressed by the manufacturer, to a satisfactory level, prior to the publication of the EDA-PIR*
- *This EDA- PIR will remain valid till next inspection up to maximum 3 years, as long as there is any warning or recall from SRA.*

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-eight Report Geneva, World Health Organization, 2014*
   Short name: WHO TRS No. 986, Annex 2
   https://www.who.int/publications/m/item/trs986-annex2
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*
   Short name: WHO TRS No. 957, Annex 2
   https://www.who.int/publications/m/item/annex-2-trs-957
3. *WHO guidance on good practices for desk assessment of compliance with good manufacturing practices, good laboratory practices and good clinical practices for medical products regulatory decisions. WHO Expert Committee on Specifications for Pharmaceutical Preparations. Fifty-second Report. Geneva, World Health Organization, 2018*

Short name: WHO TRS 1010, Annex 9
https://www.who.int/publications/m/item/trs1010-annex9

4. *WHO good manufacturing practices for sterile pharmaceutical products. Expert Committee on Specifications for Pharmaceutical Preparations. Fifty-Fifth Report Geneva, World Health Organization, 2022 (WHO Technical Report Series, No. 1044), Annex 4.* https://www.who.int/publications/m/item/trs1044-annex2

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