DOC NUMBER: **569-DB07-AIC-110-003**	CLIENT NUMBER: **PRD-AIC-TSP-016**
CLIENT: **TAKEDA/BAXALTA**	
PROJECT **BURITI EPCMV PROJECT**	

SECURITY CCTV SYSTEM

DESIGN BASIS

REV	DATE	DESCRIPTION	EXEC	CHECK	APPROV.
2	27JAN2022	ISSUE FOR CONSTRUCTION CONSIDERING COMMENTS	MAV	MAF	RSP
1	25NOV2021	ISSUE FOR CONSTRUCTION CONSIDERING COMMENTS	MAV	MAF	RSP
0	01OCT2021	ISSUE FOR CONSTRUCTION	MAV	MAF	RSP
B	10SEP2021	90% DD ISSUE	MAV	MAF	RSP
A	15JAN2021	ORIGINAL ISSUE – FOR APPROVAL	MAV	MAF	MAJ

INDEX

1. REVISION HISTORY

Rev.	Reason for change
A	ORIGINAL ISSUE – FOR APPROVAL
B	• General review in index numbering because of the new table 1 (revision history) • Updated item 2.3 • Inclusion of the Emergency Generator building in item 3 (Scope). • Updated item 6. • Updated items 7.1.1, 7.1.2, 7.2.2a, 7.2.7, 7.2.10 • Updated items 8.1.1, 8.1.2, 8.1.3.
0	• Updated item 7.2.11.
1	• Updated item 7.1.1, 7.2.7 and 7.2.10
2	• Updated items 3.1, 7.2.7

2. PROJECT DESCRIPTION

2.1 Takeda has re-negotiated a licensing and tech transfer agreement (LTTA) with the Brazilian state- owned company Hemobrás (HB) to transfer the technology of Takeda's recombinant FVIII (rFVIII) product ADVATE from Takeda to Hemobrás. Hemobrás is planning to construct a vertically integrated facility for manufacturing of rFVIII at the Hemobrás owned site at Goiana, Pernambuco (PE), Brazil (Project Buriti).

2.2 The scope of Project Buriti is to design, build and qualify a new vertically integrated rFVIII Manufacturing facility, and includes implementation of all needed support buildings and Systems (Warehouse, QC Lab, Administration, Cafeteria and Utilities) on an existing brownfield site. It is expected that the new facility is completely self-contained and the existing Goiana site provides only basic utility supply (city water, gas, power) and logistics (access road, site security). The project also must account for operation's waste management (specifically process waste). The site's capacity layout for ADVATE manufacturing shall be based on three 2500L chemostat bioreactors, even though only equipment for a two bioreactor operation should be implemented at first.

2.3 In order to guarantee an optimal integration with current facility operations, a complete functional telecommunications systems connection between the new building and the existing buildings will be designed, systems such as Security Access Control, Security CCTV, Voice&Data and so on.

3. SCOPE

3.1 This document is a technical guideline to design telecommunications systems considered for the Buriti Project (Phase 2, 3 & 4) – Building B07A, B07B, B07C and B07F.

3.2 This document has the minimum engineering requirements to be considered to integrate a complete and functional Security CCTV system to the existing facility.

4. ABBREVIATIONS

LAN	Local Area Network
VLAN	Virtual Local Area Network
Ethernet	It defines a number of wiring and signaling standards for the physical layer of the OSI networking model as well as a common addressing format and Media Access Control (MAC) at the data link layer.
IEEE 802.3	Institute of Electrical and Electronics Engineers. Standards defining the physical layer and data link layer's media Access control (MAC) sublayer of wired.
Server	Computer that links other computers or electronic devices together. They often provide essential services across a network, either to private users inside a large organization or to public users via the internet (not part of Telecom Scope).
TCP/IP	Transmission Control Protocol (TCP) is one of the core protocols of the Internet Protocol (IP) Suite. TCP provides the service of exchanging data reliably directly between two network hosts, whereas IP handles addressing and routing message across one or more networks.
OSI	The Open Systems Interconnection.- It is a way of sub-dividing a communications system into smaller parts called layers.
UPS	Uninterruptible Power Supply
CCTV	Closed Circuit Television
FPS	Frames Per Second
EMG	Emergency Generator
NPT	National pipe threaded-tapered threaded hubs
SFP	Small Form-Factor Pluggable
NVR	Network Video Recorder
UL	Underwriters Laboratories
UPS	Uninterruptible Power Supply
VAC	Voltage Alternating Current
VoIP	Voice over IP
PAL	Phase Alternating Line
PoE	Power over Ethernet
FTP	Foiled Twisted Pair
PTZ	Pan/Tilt/Zoom
LSZH	Low smoke Zero Halogen
AFFL	Above Finished Floor Level

5. REGULATIONS AND STANDARDS

5.1 Systems design, equipment, materials and procedures, considered in this project, have to fulfill the next regulations and standards:

Brazilian standards	NBR & ABNT
International Electrotechnical Commission	IEC
International Standards Organization	ISO
Insulated Cable Engineers Association	ICEA
European Committee for Electrotechnical	CENELEC
National Electrical Code	NEC
National Fire Protection Association	NFPA
American National Standard Institute	ANSI
National Electric manufacturers Association	NEMA
Good Automated Manufacturing Practices	GAMP
Institute of Electrical and Electronic Engineers	IEEE
Factory Mutual	FM
Underwriters Laboratories Inc.	UL
Electronic Industries Alliance	EIA
Telecommunications Industry Association	TIA

6. PROJECT DELIVERABLES

6.1 Drawings and documents for detail design, that follow Takeda's requirements and standards.

6.2 Drawings will be issued in AutoCAD and Documents will be issued in Microsoft Office.

6.3 Reference drawings:

7B-I-0-7-05	Riser Diagram	Drug Product	Security CCTV
7B-I-0-7-05	Riser Diagram	Drug Substance	Security CCTV
7A-I-1-3-14	Ground floor	Drug Product	Security CCTV
7B-I-1-3-14	Ground floor	Drug Substance	Security CCTV
7A-I-2-3-24	First floor	Drug Product	Security CCTV
7B-I-2-3-24	First floor	Drug Substance	Security CCTV
7A-I-3-3-34	Second floor	Drug Product	Security CCTV
7B-I-3-3-34	Second floor	Drug Substance	Security CCTV
7C-I-1-3-01	Ground floor	Boiler	Security CCTV
7F-I-1-3-14	Ground floor	Emergency Generator	Security CCTV

6.4 Reference documents:

PRD-AIC-TSP-016 - Security CCTV Design Basis

PRD-AIC-TSP-019 – Security CCTV System and Components Technical Specification

PRD-AIC-LIS-023 – Security CCTV Equipment & Devices Schedule

PRD-AIC-LIS-041 - Bill of materials - CCTV

7. ENGINEERING INFORMATION

7.1 Actual conditions.

7.1.1 The information collected in the new building (B07), stored in the NVR, will be made available through an ethernet network to the site's monitoring center.

7.1.2 New Buildings Layout:

a) Filling Drug Product (formulation/filling/lyophilization)
b) Bulk Drug Substance (up- and downstream)
c) Boilers room
d) Generators Building

7.2 CCTV system

7.2.1 This project includes the implementation of a CCTV system. This system is planned to monitor secure and process areas: personnel and facilities and to provide support to the operation and security personnel.

7.2.2 CCTV system design considers the following devices:

a) IP Cameras (Light Pole camera, Fixed internal cameras)
b) Network video recorder (NVR)
c) Monitors
d) Joystick
e) Keyboard
f) Connection accessories (patch panels)

7.2.3 CCTV system will be distributed in the following areas:

Area	Services	
	PTZ dome camera	Fixed mini-dome camera
Ground Floor		
FDP	-	11
BDS	-	4
BOILERS	-	1
EMGs	-	1
First Floor		
FDP	-	14
BDS	-	11
Second Floor		
Corridor FDP	-	4
Chiller Room FDP		1
Corridor BDS	-	4
Chiller Room BDS		1
External area	1	-

7.2.4 CCTV cameras have the following characteristics:

a) IP (10/100 BASE-T)
b) Day and night
c) Up to 30 frames per second
d) PAL
e) Video compression H.264.
f) Protocols: IPv4 , IPv6 , UDP , TCP , HTTP , HTTPS , RTP / RTCP , IGMP V2 / V3 , ICMP, ICMPv6 , RTSP , FTP , Telnet , ARP , DHCP, SNTP , SNMP (V1, MIB II) , 802.1x , DNS, DNSv6 , DDN.
g) PoE and PoE+ power supply.

7.2.5 PTZ cameras:

a) Rotate and tilt mechanisms
b) 30x Zoom
c) Pan Range: Continuous
d) Tilt Range: 0 ° to + 90 °

7.2.6 The connection of the cameras will be through FTP Cat 6A cable and not exceeding the maximum distance of 90 meters. Telecommunication outlet will be located next to the cameras for LAN integration. Cameras located at distances further than 90 m will be connected using multimode optical fiber, category OM3 multimode, 50/125 µm, 6 strands and 8500 nm wavelength and data transceivers located in BDFs and cameras cabinets.

7.2.7 The new CCTV system will be controlled and monitored from the BMS control room. Active management monitor will be in this room and storage device (NVR) will be in the Automation room, B3010. Ethernet communication to the Hemobrás backbone

should also be provided to make the information from the CCTV system available where required.

7.2.8 Video management, monitor and storage system specifications:

a) Cameras images storage time: 30 days
b) Network Video Recorder, 8 TB of storage included up to 12 TB
c) 1920 x 1080 pixels video display
d) Minimum storage images size: 4CIF (720 x 480 pixels).
e) Sampling image rate: 15 to 30 fps.
f) 24x7.
g) H.264.
h) Integrated to the LAN via Telecommunications Outlet.

*** Note**: equipment and wiring will be defined on detailed engineering process as well as the location of each device, identification, communication network and all physical and logical infrastructure.

7.2.9 Management software is based on a client- server architecture to allow simultaneous connection of 5 users at least, with different access privileges. Advanced search capability included. Multiple video playbacks in real time or during recording. High-speed searches by date and time or alarm. External USB record capable.

7.2.10 Real time and recorded video are displayed in the existing LED monitor located in BMS Control room. For cameras control and selection, a Joystick / keyboard is considered. Ethernet communication to the Hemobrás backbone should also be provided to make the information from the CCTV system available where required.

7.2.11 Power supply for cameras located in distances no further than 90 meters will be from the patch panel is PoE (Power over Ethernet). Power supply for cameras located further than 90 meters will be from small box with a 24 VAC power supply which is powered by a 220 VAC UPS.

8. DESIGN REQUIREMENTS

8.1 Power supply

8.1.1 CCTV systems equipment will be powered via an UPS input voltage of 220 VAC @ 60 Hz, considering a 15 minutes power backup at full load in case of main power system failure. In case of the UPS is powered by generator voltage the back-up time would be that of the generator.

8.1.2 CCTV field devices will be Power over Ethernet (PoE) through UTP cable from the switch. The switch will be powered via an UPS input voltage of 220 VAC @ 60 Hz, considering a 15 minutes power backup at full load in case of main power system failure. In case of the UPS is powered by generator voltage the back-up time would be that of the generator.

8.1.3 CCTV systems power supply is Electrical design scope. For cameras that are more than 90 meters away, there must be a small box with a 24 VAC power supply which

is powered by a 220 VAC UPS. The small box with 24 VAC power supply shall be supplied by the CCTV contractor.

8.2 Cable Pathways

8.2.1 Hot dip Galvanized Steel wire basket and conduit is considered in administrative areas. They will be installed on walking ceiling floor, preferably.

8.2.2 Hot dip Galvanized Steel conduit and fittings is considered in production areas.

8.2.3 Stainless Steel conduit and fittings is considered in clean rooms.

8.2.4 Cable will not exceed 40% of occupancy in conduits and 50% in cable trays.

8.2.5 Cable tray and conduit pathways will be supported to the ceiling or to the wall every 1.8 to 2.5 meters according to the area.

8.2.6 No more than two 90° curves are allowed between pull boxes or device boxes.

8.2.7 A pull box must be considered in pathways with distances larger than 30 meters.