SECTION 284620 – PLC / GUI CONTROL SYSTEM SOFTWARE

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

A. Drawings and general provisions of the Contract, including General and Supplementary conditions and Division 1 Specifications Sections, apply to this Section.

1.2 SCOPE INCLUDES:

A. Furnish all software and programming labor necessary to complete the installation of specific systems described herein and integration of all systems as indicated, specified herein or both. The work includes the following, as well as work not listed below but described elsewhere:

1. Programming of Security Systems Management Computer (SSMC). Include programming that implements system transaction logging, storage and database retrieval functions.
2. Programming of Graphical User Interface Consoles (GUI). Include programming that implements touch-screen control and monitoring functions defined in project documents.
3. Programming of Intercom system. Include programming that implements Intercom internal functions and integration with the GUI.
4. Programming of the Network Video Management System, including programming that implements internal NVMS functions as well as integration with the GUI.
5. Scope includes the provision programming changes for owner requested modifications to system operation at the 6 month, 12 month and 24 month walk thru.

PART 2 - PRODUCTS

2.1 GUI SOFTWARE/GRAPHICS

A. Specifications

1. Provide displays utilizing accurately depicted, properly aligned floor plans. Floor plans must be displayed as seen from the GUI console operator's perspective (i.e.; rooms and doors in front of the operator at the top of the display, rooms and doors behind the operator at the bottom of the display).
2. Provide displays that optimize the use of screen resolution and color to enhance and simplify the information displayed. Provide a textured, dull, light gray background for all displays. Provide displays that minimize the unnecessary use of highly saturated colors. Provide displays that utilize contrasting colors. Utilize color to clarify annunciation, highlight choices and indicate correct operator input.
3. Provide properly sized control icons that are a minimum 1/2" square. Control icons must be large enough to facilitate proper and easy operation. Control icons that are not easily operated will be enlarged and/or isolated to improve operability at no cost to the Owner/User.

4. Provide control icons and annunciation icons that provide an intuitive depiction of their purpose. Control icons and annunciation icons shall utilize color to indicate abnormal or "on" conditions only. Control icons and annunciation icons associated with devices that are in a normal or off state shall utilize muted, de-saturated colors.
5. Provide programming that uses a cursor to depict the control icon that has the current focus. Provide programming that allows the user to place a cursor on the screen and "drag" the cursor over the desired control icon, activating the associated function when the cursor is released ("activation on liftoff"). As the cursor moves over a control icon, the icon should "highlight" to indicate that if the cursor is released the icon will activate. Annunciation only icons should not function in this fashion.
6. Provide a mouse for each GUI. Moving the cursor with the mouse shall provide the same highlighting function as described above. Touching or left clicking the mouse shall release the cursor.
7. Provide programming that ensures that any screen can be displayed in a maximum of two (2) touches. Provide "pan" function icons to display adjacent areas. Provide "zoom" function icons to display enlarged views of areas.
8. Screen display redraw/update/remote device response time thru-put shall be held to 0.5 seconds maximum. Activating a control icon shall cause the associated field device to operate within 0.5 seconds maximum. A field device that changes state must cause an annunciation icon to change state within 0.5 seconds maximum.
9. Provide the number of graphic "screens" that supports the sequences of operation verified with the Owner and Architect during the software development process described in Part - 3.1, Software Support. Any screen that the user or security consultant determines is too densely populated or too "busy" will be subdivided at no expense to the Owner.
10. Locate global control function icons on bottom quarter of display. Separate global control function icons from floor plan graphics with an information text line.
11. Locate miscellaneous functions icons (e.g. help, interlock override, emergency functions, etc.) on left or right sides of the display. This location shall be configurable by the user.
12. Place icons for "high traffic" functions on multiple screens as verified with the Owner and Architect during the software development process described in Part - 3.1, Software Support. Any icon that the user or security consultant determines is necessary on more than one screen will be provided on more than one screen at no cost to the Owner/User.
13. Provide software that annunciates alarms until they are acknowledged, independent of screen displayed. Provide prioritization of alarms as verified with the Owner and Architect during the software development process described in Part - 3.1, Software Support.
14. Provide a method for unanswered alarms to move to a designated GUI as verified with the Owner and Architect during the software development process described in Part - 3.1, Software Support.
15. Graphical User Interface operators consoles are intended to operate in concert with each other, i.e.; Silencing an alarm on one screen causes the alarm to be silenced on all other screens displaying the same alarm. Multiple operations on multiple screens to silence the same alarm are not acceptable.
16. Hierarchy of Control - During the software development process described in Part - 3.1, designated GUI takeover scenarios will be confirmed and provided by the Contractor under Base Bid.
17. During the software development process described in Part - 3.1, designated interlock groups will be confirmed and provided by the Contractor under Base Bid.

18. Provide a "Supervisors Utility Screen", protected by a pin code, to allow updating of modifiable system parameters as verified with the Owner and Architect during the software development process described in Part - 3.1, Software Support.
19. Provide for instant connection of the intercom system master station to the calling station selected from the GUI.
20. Provide instant display or manual selection of the screen showing the alarm location or the calling intercom location graphically as verified with the Owner and Architect during the software development process described in Part - 3.1, Software Support.
21. Provide automatic GUI calibration during System "boot-up" without operator input and manual calibration accessible from the Supervisors Utility Screen.
22. Displayed device status on a graphical representation of the facility floor plan using icons (symbols), which display colors to represent the abnormal status of the devices represented.
23. Provide user selectable audible feedback on all icon commands. This audible feedback shall be selectable between male voice, female voice, or a tone. This shall be selected from the miscellaneous function icons as described above.
24. Provide unauthorized entry alarm for monitored or controlled door going unsecured with no corresponding unlock command from system; on GUI, provide visual and unique audible annunciation and location information on message text line.
25. Provide 2 step operations for activations of devices that reduce the security or safety of the facility. Theses operations include, but are not limited to unlocking doors, holding doors open, group release, isolating doors or intercoms, etc.
26. Provide 3 step operations for critical changes to secure status such as interlock overrides, emergency release, etc.
27. Provide single step operations for operations that increase or have no impact on secure status such as locking doors, intercom select, etc.
28. Provide architectural labeling of rooms and spaces, owner defined labeling of rooms and spaces, and the ability for the operator to switch between the two labeling schemes.
29. Provide the ability to do hard copy and archival logging of all system events and transactions.
30. Provide programming that disables all methods of switching from the security control application to the operating system except with appropriate supervisory level password.
31. The development tools used for the graphical interface shall be that of a nationally recognized industrial applications software development package with a national support network.

B. Acceptable Manufacturers

1. Wonderware Intouch
2. Rockwell Software RS View
3. GE Cimplicity

2.2 GUI CONTROL STATION ICON (SWITCH) FUNCTION AND DESCRIPTION

A. Specifications

1. GUI Switch Functions

a. Door Control Icons
b. Utility Control Icons (Lighting, Power, Telephone, Smoke Evac)
c. Log In/Out, Satellite GUI Takeover and GUI Disable Icons

d. Intercom Control and Call Disable Icons
e. Key Plan Zoom Window
f. Alarm Silence and Reset Icons
g. Elevator Controls
h. Other functions as defined during the software development process described in Part - 3.1, Software Support.

2. Provide animation of actual control and annunciation icon as verified with the Owner and Architect during the software development process described in Part - 3.1, Software Support.
3. Door Control Icons

a. Door Unlock

1) Touch or left click the Unlock global function icon.
2) Touch or left click the associated door icon.
3) The security system momentarily applies power to the lock or electrically operated door to start the lock or door through it's unlock or open cycle.
4) The unlock function remains enabled for 3 seconds after each door icon is touched. If the timer lapses and no icon is selected, the unlock global times out and must be selected again to reactivate the function.

b. Group Unlock

1) Touch or left click the Unlock global function icon.
2) Touch or left click the associated door group icon.
3) The security system momentarily applies power to the locks or electrically operated doors in the group one at a time to start them through their unlock or open cycles.
4) During a group unlock, an isolated door will not be powered.
5) The unlock function remains enabled for 3 seconds after each door icon is touched. If the timer lapses and no icon is selected, the unlock global times out and must be selected again to reactivate the function.

c. Door Hold Open

1) Touch or left click the Hold Open global function icon.
2) Touch or left click the associated door icon.
3) The security system applies power to the lock or electrically operated door to maintain the lock or electrically operated door in the unlock or open position.
4) The held open function remains enabled for 3 seconds after each door icon is touched. If the timer lapses and no icon is selected, the hold open global function times out and must be selected again to reactivate the function.

d. Group Hold Open

1) Touch or left click the Hold Open global function icon.
2) Touch or left click the associated door group icon.
3) The security system applies power to all the locks or electrically operated doors one at a time to maintain them in the unlock or open position.

4) During a group hold open, an isolated door will not be powered.
5) The held open function remains enabled for 3 seconds after each door icon is touched. If the timer lapses and no icon is selected, the hold open global function times out and must be selected again to reactivate the function.

e. Door Lock

1) Touch or left click the associated door icon.
2) If necessary, the security system momentarily applies power to or removes power from the lock or electrically operated door to start the lock or door through its lock or close cycle.

f. Group Lock

1) Touch or left click the associated door group icon.
2) If necessary, the security system momentarily applies power to or removes power from the locks or electrically operated doors one at a time to start them through the lock or close cycle.

g. Door Stop

1) Touch or left click the Stop global function icon.
2) The security system will stop all powered moving doors being controlled by the initiating GUI.

h. Isolate

1) Touch or left click the Isolate global function icon.
2) Touch or left click the associated device icon. (doors or intercoms)
3) The security system isolates the device from normal operation.
4) The isolate function toggles each time a device is selected. The isolate global function remains active for 3 seconds after the last device selected.
5) Provide group "synchronization." Selecting the isolate global function and a group button the first time will un-isolate any door in the group that is currently isolated. Selecting the group button the second time, will isolate all doors in the group.

i. Emergency Door Release

1) Touch or left click the EMERGENCY DOOR RELEASE miscellaneous function icon.
2) When the EMERGENCY DOOR RELEASE icon is selected, a red pop up message box will be displayed with a written warning and the audible annunciation will warn the operator of the danger associated with an Emergency Door Release. The audible warning must reiterate the displayed text and must play in its entirety before the first level confirmation icon is displayed.
3) A second, red EMERGENCY DOOR RELEASE warning box will then appear on the current screen with a written warning.
4) The function can be canceled at any time by selecting the CANCEL button.

5) After the second confirmation is selected, the background around the EMERGENCY DOOR RELEASE icon shall flash and the audible annunciation shall continuously announce "EMERGENCY DOOR RELEASE".
6) All emergency door release push buttons will be enabled. Those doors that are unlocked under the emergency door release, will display as if opened via the control system.
7) Other control stations also monitoring or controlling the same doors as the panel initiating the release will have an EMERGENCY DOOR RELEASE ACTIVE indication located on their screen and will alarm and flash as described previously.

j. Interlock Override Icon

1) Touch or left click the Interlock Override miscellaneous function icon.
2) A yellow pop up message box will be displayed with a written warning and the audible annunciation will warn the operator of the danger associated with interlock override. The audible annunciation warning must reiterate the displayed text and must be capable of playing in its entirety before the second level confirmation icon is displayed. Delay must be adjustable and confirmed during phase I and II.
3) A second yellow interlock override warning box will then appear with a written warning. The audible feedback warning must reiterate the displayed text and must be capable of playing in its entirety before the first level confirmation icon is displayed. Delay must be adjustable and confirmed during phase I and II.
4) Only after the second confirmation is made will the interlock indications be removed from the screen.
5) Once any door icon is selected, the interlock override function will cancel. If no door icons are selected within 10 seconds of the second confirmation, the interlock override function will cancel. Also, the function can be canceled at any time by selecting the "CANCEL" icon.
6) Attempting to unlock a door that is interlocked will cause the voice annunciation system to state, "Function not allowed. Door is interlocked."

4. Utility Control (Lighting, Power Receptacles, Telephone Smoke Evac and Water)

a. Touch or left click the global utility icon, the normal icons are hidden and the utility icons are displayed.
b. Touch or left click the associated control icon.
c. The security system removes power from the coil of the low voltage relay associated with the device to be controlled, and the utility comes on.
d. Where a device requires separate open/close or on/off actions, the control circuitry will accommodate the device, however the GUI will still function as described herein.
e. Touch or left click the icon a second time.
f. The security system applies power to the coil of the low voltage relay and maintains power until the icon is clicked again. When the relay is engaged the utility is off.
g. Provide group control of cell lights.
h. Provide group "synchronization." Selecting the group button the first time will turn any utility in the group that is currently on to its off state. Selecting the group button the second time, will turn all utilities in the group on.

5. Log In, Satellite GUI Takeover and GUI Disable

a. Log In/Out

1) Touch or left click the Log in/out icon.
2) Login validation will be integrated with the SSMC's database to allow the tracking of the operators name for all functions at each GUI until it is logged off.
3) Operator presents credentials to log in proximity reader,
4) The GUI displays a "scrambled" numeric keypad for the operator to enter a PIN code.
5) If the PIN code is valid the operator is logged in as the current operator of the station.
6) An operator remains the current operator until a new operator is logged in or until the GUI is taken over or disabled (see below).
7) Open operator's stations will automatically log out after a preset time of no activity. The time the station must be idle to active the log out is user definable from the supervisory screen.

b. GUI Takeover

1) Touch or left click the GUI Takeover icon. The takeover sequence also starts if a satellite GUI computer fails.
2) The security system disables all control and monitoring functions at the Satellite GUI, blocks all attempts to log in at the Satellite GUI and transfers control and monitoring responsibility to the GUI initiating the takeover. Icon shows "Off Line".
3) When in takeover mode, touch or left click the icon.
4) The security system allows attempts to log into the Satellite GUI, but retains control and monitoring until an operator logs into the Satellite GUI.
5) When an operator is logged in to the Satellite GUI the control system returns all previous control and annunciation to the Satellite GUI. Central Control will still have the ability to view the locally controlled screens. Central Control's icons in these locally controlled areas will appear to be "sunken" into the screen with a passive or muted video color. The status of the DPS and LSS will be dynamically displayed. The intent is to allow Central Control to be aware of door movement throughout the building, while leaving control of devices with the Satellite GUIs.

c. GUI Disable

1) Touch or left click the Disable icon.
2) The security system immediately logs out the current station operator and transfers responsibility for control and annunciation to central control. Satellite GUI will still have the ability to view the locally controlled screens. The icons in these locally controlled areas will appear to be "sunken" into the screen with a passive or reverse video color. The status of the DSS and LSS will be dynamically displayed. The intent is to allow the Satellite GUI to be aware of door movement in their areas, while control is transferred to the designated

control point.

3) Attempts to log into the station are honored.

6. Intercom Control

a. Intercom Control

1) Call-in from field device causes associated Intercom Station icon to flash and tone/VAS to sound.
2) Selecting the Intercom Station icon connects the Master Intercom to the associated intercom station in listening mode, turns the icon solid color and silences the call in tone/VAS.
3) Selecting the same icon a second time disconnects the call, and turns off the solid icon color.
4) Selecting a second intercom icon while connected to another station causes the connected station to disconnect and connects the selected station.
5) When a call is designated to route to more than one master, the establishing of a talk path by the first to answer the call, cancels the call at the other stations.
6) The intercom system incoming shall be routed through the GUI Audio System.

b. Communications Window

1) A portion of each screens tool bar, without obstruction to the floor plan, shall be allocated for intercom que. This window shall contain a "Pending List" of the next (7) pending calls.
2) Call Control Icons and Indicators include:

a) ACTIVE STATION containing the text name of the active intercom call
b) Master to Master call (Caller ID)
c) Master call waiting/busy
d) CALL ANSWER button
e) CALL ANSWER AND ZOOM button
f) ZOOM ACTIVE button
g) CALL DISCONNECT button

3) This window will allow the operator to answer calls without having to go to a particular screen (answer) unless it is desired to do so. (answer and zoom)

c. Pending List

1) All incoming calls shall appear on the GUI.
2) The list of incoming pending calls designated for the particular GUI shall show the owner-assigned text names for the oldest seven pending calls that have not been answered and in the order that they were initiated.
3) As a call is answered it shall be removed from the list and the list shall be automatically updated with any new incoming calls.
4) If a call-in is isolated, it should not be displayed in the Pending List.

5) If a master to master call is placed, and the receiving master is busy, the calling master receives a busy prompt and is held in queue until call is accepted by the master being called.
6) Readout text line on GUI shall contain-

a) The station number in order of entry into the system.
b) Number of calls waiting.
c) Priority level of the calls.

d. Call Answer Button

1) Touch or left click the Call Answer Button
2) Each time this button is selected, the active station will automatically cancel and the first station on the pending list will automatically connect.
3) If there are no pending calls, this button will be muted on the tool bar.

e. Call Answer and Zoom Button

1) Touch or left click the Call Answer and Zoom Button
2) Each time this button is selected, the active station will automatically connect to the first station in the call queue.
3) The GUI will automatically go to the screen where the answered intercom station is located.
4) If there are no pending calls, this button will be muted on the tool bar.

f. Zoom Active Button

1) Touch or left click the Zoom Active Button.
2) When this button is selected, the GUI will automatically go to the screen where the connected intercom station is located.
3) If there is no active call, this button shall be muted on the tool bar.

g. Call Disconnect Button

1) Touch or left click the Call Disconnect Button
2) When this button is selected, the active intercom call is disconnected.
3) If no station is connected, this button shall be muted on the tool bar.

h. Provide switching for transferring all stations, normally connected to a master, to any other operational system master.

7. Paging Control

a. Zone or ALL CALL paging

1) Touch or left click the individual zone or all call icon
2) Page function activates and icon is highlighted
3) Push to talk is active on page/intercom microphone
4) Touch or left click the icon again to deactivate paging and mute the icon.

8. Elevator Control

   a. Car panel will not function under normal operation. All elevator movement will be via remote control from console A/B.
   b. In "Secure" mode, the normal daily mode the elevator will operate in, the car panel and the lobby call buttons are disabled and the security control system has full control of the elevator. The intercom system is used to call the car to a given floor. The Touch Screen is required to emulate the control and indication functions of the car panel. Elevator ZE is the exception and will not be remotely controlled, but will be controlled via the car panel.
   c. Elevator control icons will be located on the tool bar and will not require a dedicated screen.
   d. Interface between the elevator controllers and the PLC system are designed as discrete dry contact relay interface for all control and indication functions.

9. Key Plan and Zoom Window

   a. Zoom Window

      1) A portion of the tool bar on each screen, without obstruction to the floor plan, shall be allocated for the key plan. This window shall contain a whole site plan and be located on every screen.
      2) All screens shall be accessible with no more than two touches of the site plan.
      3) Any screen can be accessed from any other screen with no more than two touches. A screens outlined area on the site plan will highlight when the curser is placed over the associated section of the key plan.
      4) Each control screen shall be geographically outlined on the Zoom Window. The highlighted outline will follow the shape and pattern of the zoom screen area.
      5) The Zoom Window shall contain -

         a) Zoom Area
         b) Site Plan Location Indicator
         c) Site Plan Pending Call Indicator
         d) Site Plan Alarm Indicator

   b. Zoom Area

      1) Touch or left click outlined area of the site plan.
      2) Activation will cause the GUI to go directly to the screen that controls the selected area or a more detailed zoomed area.
      3) A distinctive audible sound shall annunciate when this action is performed.

10. Site Plan Location Indicator

   a. The area on the site plan that represents the current screen shall be highlighted in white to indicate exactly what screen is active in relation to the whole facility.
   b. The other areas shall be gray unless pending calls or alarms are active as explained in the Site Plan Pending Call Indicator and the Site Plan Alarm Indicator.

11. Site Plan Pending Call Indicator

    a. When calls are pending from areas other than the current screen, then the area of the call shall flash on the site plan.
    b. If both an alarm and a pending call are active at the same time in an area, then the respective area shall flash alternating colors.

12. Site Plan Indicator

    a. When alarms are active from areas other than the current screen, then the area of the alarm shall flash on the site plan.
    b. If both an alarm and a pending call are active at the same time in an area, then the respective area shall flash alternating colors.

B. Alarm Silence and Reset Icons

1. Alarm Silence

    a. When an audible alarm annunciation is sounding; touch or left click the Alarm Silence icon.
    b. The audio alarm stops.
    c. The audio alarm starts again if alarm conditions exist on other screens, or if new alarms are received on the same screen.

2. Alarm Reset

    a. Provide the Reset Icon to reset all alarmed icons to normal conditions if they are not of the self-resetting type.
    b. Touch or left click the Reset icon when the alarm conditions no longer exist.
    c. Reset function shall only operate on those alarms annunciated on the active screen. No global alarm reset icons will be allowed.

C. Occurrence Log

1. Entry of New Occurrence Logs

    a. User can enter text via the attached keyboard.
    b. As characters are selected on the keyboard they should be displayed on the appropriate field.
    c. Select the submit button to save the entered text into the SSM computer.
    d. After submitted, status should indicate that the text has been sent and saved successfully, and the title and log fields should be cleared. If the text is not sent and saved successfully, the status should indicate "Log Entry Failed", and the title and log fields should not be cleared.
    e. Select clear button to clear title and log fields.
    f. Select view logbook button to view previous entries within the last 24 hours.
    g. Occurrence log entry shall be as illustrated herein.
    h. Title field shall be capable of 100 characters.

2. Viewing Previous Entries

   a. Shall be capable of viewing 100 logged entries.
   b. The retrieval time shall be less than 10 seconds.
   c. Select the view log entry button to return to the new occurrence log entry screen.
   d. All data is stored on the SSM computer.

2.3 GUI CONTROL STATION INDICATOR CONDITONS

A. Door Status - Provide red and gray (or white) animated graphic indicators on the screen at each door to be monitored, to indicate the status of the door. Monitor the Door Position Switch (DPS) and the Latch Bolt Monitor (LBM) switch independently. For electromagnetic locks, monitor the bond sensor. Secure indication should only be displayed when both switches are in the secure condition. Differentiate between doors that are open, and doors that are closed but unlocked. Alarm is generated for unauthorized opening of doors; doors opened via unlock commands and doors left open too long. Timer for door open too long must be adjustable via supervisor's utility screen.

   1. Flashing Red - alarm
   2. Red - unsecured
   3. Gray or white – secured

B. Utility Status – Provide yellow and gray animated graphic indicators on the screen at each utility location to indicate the utility status.

   1. Yellow – Utility On
   2. Gray - Utility Off

C. Log In/Out, Satellite GUI Takeover, and GUI Disable – Provide a gray animated graphic indicator that contains the appropriate text.

D. Intercom Control and Inmate Call Disable – Provide green, yellow, and gray animated graphic indicators on the screen at each intercom location, to indicate the intercom status.

   1. Flashing Green – Intercom call-in
   2. Green – Intercom active
   3. Yellow "X" - Intercom call-in isolated
   4. Gray – Intercom inactive
   5. "Sunken" – Intercom station calls to another master.

E. Alarm Silence and Reset – Provide a gray animated graphic indicator that contains the appropriate text.

F. Interlock Status - Provide yellow color indicators at each door in an interlock group.

   1. When a door in an interlocked group becomes un-secure, illuminate yellow indicators on all other doors in the interlock group.
   2. VAS will annunciate that door cannot be unlocked if interlock condition exists (see below)

G. Uninterruptible Power System Alarm and System Trouble Icon

1. UPS Power System Alarm

a. Upon loss of primary AC power, the UPS icon will appear and begin to flash red "Inverter On", accompanied by a unique tone.
b. Activating the alarm silence Icon will silence the tone and cause the Icon to glow steadily. Upon return of primary AC power, activating the alarm reset Icon will extinguish the red indication and hide the icon.

2. Similar function for Trouble indication. Flashing yellow "UPS Trouble" indication.

H. Pneumatic Lock Air System Alarm

1. The PLC will monitor a dry contact from the air compressor that will close when the air pressure drops below the minimum threshold.
2. Upon contact closure the "Low Air Pressure" icon will appear and flash red.
3. Activating the alarm silence icon will silence the audible alarm and cause the icon to illuminate steadily.
4. The alarm can only be reset once the air pressure is above the minimum threshold.

I. Provide access to a system status screen with text display of the following:

1. Name of operator logged on to each console
2. List of all pending, silenced, and acknowledged alarms currently indicated through the entire system.

2.4 VOICE ANNUNCIATION SYSTEM

A. Provide a Voice Annunciation System (VAS) as an additional interface between personnel and the computer system. The VAS shall use speech from a stored vocabulary to provide alert and annunciation messages, special direction or information to facility staff in staff areas (intercom speakers) and control rooms. Verify message requirements and locations during Phase-1 software meeting.

1. The VAS shall be entirely electronic, no tapes, and meet the following minimum requirements

a. The VAS shall speak individual words, phrases and sentences in addition to tones.
b. VAS will provide output to audio amplifiers, speakers and intercom speakers that are also part of system.
c. The VAS shall be selectable between male voice, female voice, and a tone. This shall be selected from the miscellaneous function icons as described above.

2.5 SECURITY SYSTEM MANAGEMENT COMPUTER (SSMC) OPERATIONAL REQUIREMENTS

A. Specifications

1. The Security System Management Computer (SSMC) shall perform functions including, but not limited to, the following:

   a. Programming of PLC.
   b. PLC system remote diagnostic capabilities.
   c. Encrypted recording all security control system transactions and events.
   d. Encrypted recording of incident reports.

2. The SSMC shall generate reports of the recorded transactions and events within the system. All data shall be recorded into an encrypted relational database and the SSMC shall have the capability to generate reports through selection of any data field or timeline. The SSMC shall have advanced search capabilities for any combination of data and can search the incident logs independently.

PART 3 - EXECUTION

3.1 SOFTWARE SUPPORT

A. Phase I

1. The Contractor shall request, in writing, scheduling of the Phase I meeting within one (1) week of receiving the approved shop drawing submittal. A proposed agenda shall be included with the request. The Phase I meeting shall be held within thirty (30) working days of receiving the approved shop drawing submittal.
2. The purpose of the Phase I meeting is to define the project specific functions and operational procedures of the control system with the Owner & Architect. The Contractor shall present proposed operational procedures for every function specified in the Contract Documents or recognized as industry standard or convention for a correctional facility Control System. The Contractor will present proposed operational schemes to the Owner/User & Architect, and modify those schemes based on the Owners policies and procedures.
3. The Contractor shall address integration of the components and subsystems making up the control system when presenting the proposed operational procedures. The Contractor shall provide an operating GUI at the Phase I meeting (that demonstrates an operating facility or this facility) to help with Owner's design decisions. This demo shall not include any operational procedures that are not included in the base bid for this project. This operating GUI will demonstrate all data capture and reporting features of the SSMC.
4. The Contractor shall prepare and present 3 sets of color screen drawings at this meeting. As a minimum, these screen drawings shall depict the following:

   a. Overall building layout screen.
   b. Area control screens. (These area screens should be drawn to represent actual orientation with control officer's view). Different orientation views should be created per each control post and the control officer's orientation view.

c. All special control and transition screens. (Utility, Administration, Occurrence log data fields, help, etc.)
d. Each sheet should be numbered for easy reference.
e. Size adequate to show detail and all text legible.

5. The Contractor shall prepare a detailed report summarizing the operation of all icons. The report is to be submitted for approval by the Architect no later than two (2) weeks prior to the date of the Phase I meeting. The software systems that make up the control system shall be designed specifically from this document. As a minimum the report shall contain the following:

a. A procedural description of each and every control and monitoring function.
b. A procedural description of all administrative functions available to supervisory and maintenance personnel (e.g. log in code maintenance, alarm time zone programming).
c. A preliminary technical description of how each function will be accomplished (i.e. what part HMI software plays, what part PLC programming plays, what part integrated systems programming plays) This technical description will include I/O maps, Flow Diagrams, etc. for verification that the control logic resides in the PLC and that the GUI programming does not directly control the I/O.
d. Schedules of integrated actions (e.g. Video Follow Audio schedules, Video Follow Alarm schedules, etc.) by GUI control location.
e. The Architect will produce meeting minutes from the Phase I meeting indicating all non-compliant items requiring the contractor's response, and confirming decisions reached. The contractor will re-submit the Phase I report and screen drawings within 2 weeks of receiving the Phase I meeting minutes.

B. Phase II

1. At least thirty (30) working days prior to the scheduled date for job site delivery of the first control system head end components, the Contractor shall request a Second meeting with the User (maximum of 4 representatives) and the Architect (2 representatives) at the Security Electronics Contractor's manufacturing facility. The Security Electronics Contractor shall provide a full demonstration of the completed control system with fully functional control software. The Security Electronics Contractor shall provide means to simulate all real world conditions necessary to demonstrate each function and operating procedure agreed to in the Phase 1 meeting. The design and function of the software shall match the exact performance as specified in the revised Phase I report. The Security Electronics Contractor shall be responsible for the cost of travel expenses incurred by the four owner representatives for this trip. Travel expenses shall include ground transportation, hotel accommodations, and meals.
2. All performance deviations and necessary changes identified at this meeting shall be documented by the Contractor on a "pre-punch list", which shall be submitted to the Architect for approval. The pre-punch list shall be 100% corrected by the Security Electronics Contractor prior to delivering the equipment to the job site.
3. During this time period the Contractor shall perform all shop testing as defined in the approved testing plan (see Section 28 05 00, "Training Plan and Documentation").
4. Within five (5) working days after the Phase II meeting, the Contractor shall provide and install a working GUI at the Owner's premises (GUI shall be on loan to the user until the renovated space is occupied and shall not be utilized as spare equipment). This control shall utilize the actual software for the facility to provide staff training.

C. Phase III

1. Immediately following the installation and testing of the control system, the Contractor shall work with the Owner/User, facility personnel and the Architect to correct any problems or operational deviations from the original Phase I and Phase II design documents. The Contractor shall perform all hardware and software modifications necessary to correct any problems or operational deviations resulting from engineering, programming or installation services provided by the Contractor.
2. Upon achieving a 100% functional control system as determined by the Architect, a documented release form provided by the Contractor shall be signed by the Owner, and retained on file with the Architect. The Contractor shall continue to work on the installed system at no cost to the Owner until the Architect has determined the Phase I and Phase II documents have been met and the system has been 100% field tested as defined in the approved testing plan (see Section 28 05 00, "Training Plan and Documentation"). The system warranty will begin after the Architect has verified 100% compliance has been met.

3.2 INSTRUCTION PERIOD

A. Provide the facility personnel with training (Refer to Section 28 05 00 in the use and maintenance of the entire control system. The first sessions to be prior to system turnover, the Second at turnover and the third immediately after turnover. Coordinate the training sessions with the Owner/User. Completed classroom sessions will be documented by the Contractor, certified by the attending Owner/User representatives, and approved by the Architect. Instruction shall take place during normal working hours (Monday through Friday, 8:00 a.m. to 5:00 p.m.). Instruction will not begin until all systems are operational as designed.

B. The training sessions will cover the operation and the maintenance manuals and the control console operators manuals and service manuals in detail, stressing all important operational and service diagnostic information necessary for the maintenance and operations personnel to efficiently use and maintain the control system.

C. Provide (one copy for each control station) a bound and illustrated control console operator's manual and four copies of a service manual. The operator's manual shall be written in laymen's language and printed so as to become a permanent reference document for the operators, describing all control panel icon operations, graphic symbol definitions and all indicating functions and a complete explanation of all software. The service manual shall be written in laymen's language and printed so as to become a permanent reference document for maintenance personnel, describing how to run internal self-diagnostic software programs, troubleshoot head-end hardware and field devices with a complete scenario simulation of all possible system malfunctions and the appropriate corrective measures. Both manuals shall be prepared and submitted for approval by the Architect prior to the training sessions. Approval shall be based on professional structure, completeness of technical information, and understandability.

END OF SECTION 284620