

SECTION 28 52 31
EMERGENCY CALL SYSTEM

PART 1 - GENERAL

1.1 DESCRIPTION

- A. This section specifies the complete and operating emergency call system, including instruments (stations), security strobe, stanchions and associated equipment here-in-after referred to as the "system".

1.2 RELATED WORK

- A. Electrical conductors and cables in electrical systems rated 600 V and below: Section 26 05 19, LOW VOLTAGE ELECTRICAL POWER CONDUCTORS AND CABLES.
- B. Requirements for personnel safety and to provide a low impedance path to ground for possible ground fault currents: Section 28 05 26, GROUNDING AND BONDING FOR ELECTRONIC SAFETY AND SECURITY SYSTEMS.
- C. Requirements for personal safety and to provide a low impedance path for possible telecommunications ground fault currents: Section 27 05 26, GROUNDING AND BONDING FOR COMMUNICATIONS SYSTEMS.
- D. Voice and data distribution sub-systems, and associated hardware including telecommunications outlets (TCO); copper and fiber optic distribution cables, connectors, "patch" cables, and "break out" devices: Section 27 15 00, COMMUNICATIONS STRUCTURED CABLING.
- E. Conduits and partitioned telecommunications raceways for Electronic Safety and Security systems: Section 28 05 28.33, CONDUITS AND BACK BOXES FOR ELECTRONIC SAFETY AND SECURITY.
- F. Section 28 13 00, PHYSICAL ACCESS CONTROL SYSTEM.

1.3 SUBMITTALS

- A. In addition to requirements of Section 27 05 11, REQUIREMENTS FOR COMMUNICATIONS INSTALLATIONS provide:
 - 1. Names, locations and contact information for three or more installations of operating emergency call station systems of comparable size and complexity previously installed by contractor performing satisfactorily for at least one year after final acceptance by user.
 - 2. Copies of applicable licenses.
- B. Certifications:
 - 1. Submit certification equipment provider has been OEM authorized distributor and service organization for three years.

2. Certification that technicians assigned to system are trained, qualified, and certified by OEM on engineering, installation, operation, and testing of system. Submit certificate of successful completion of OEM's installation/training school for every installing technician of equipment.
3. Submit OEM letter certifying authorization to pass OEM's warranty of equipment to Government.

C. Closeout Submittals:

1. Before the project closeout date submit:
 - a. Warranty certificate.
 - b. Evidence of compliance with requirements of governing authorities such as Low Voltage Certificate of Inspection.
 - c. Project record documents.
 - d. Instruction manuals and software that is a part of system.
2. Submit written notice that:
 - a. Contract Documents have been reviewed.
 - b. Project has been inspected for compliance with contract.
 - c. Work has been completed in accordance with the contract
3. Project Record Documents (As Built):
 - a. Throughout progress of work, maintain an accurate record of changes in Contract Documents. Upon completion of Work, transfer recorded changes to a set of Project Record Documents.
4. Mark floor plans in pen to include the following:
 - a. Device locations with labels.
 - b. Conduit locations.
 - c. Equipment specific locations.
 - d. Wiring diagram.
 - e. Labeling and administration documentation.
 - f. Warranty certificate.
 - g. System test results.

1.4 QUALITY ASSURANCE

A. Supervision:

1. Assign a single project manager to this project to serve as point of contact for Government, General Contractor, and design professional.
2. Assigned individual to initiate and maintain discussion with General Contractor regarding the schedule for ceiling installation and complete cabling to meet that schedule.

- B. Approvals: Contact Office of Telecommunications, Special Communications Team (0050P2H3) at (202) 461-5310 to have a VA Certified Telecommunications AHJ assigned to the project for telecommunications review, equipment and system approval and co-ordination with VA's Spectrum Management and FMS Teams.

1.5 DELIVERY, STORAGE, AND HANDLING

- A. Deliver, store, and handle products using means and methods that will prevent damage, deterioration, and loss, including theft.
- B. Store products in original containers.
- C. Plan to store materials off site due to limited storage available on site.
- D. Do not install damaged products. Remove damaged products from the site and replace with new products.

1.6 WARRANTY

- A. Comply with FAR clause 52.246-21, except as follows:
 - 1. Manufacturer shall warranty their equipment and certified installation for a minimum of two years from date of installation and final acceptance by the government. Submit manufacturer warranty during the submittal process.
 - 2. Provide, free of charge, product firmware/software upgrades for a period of two years from date of acceptance by Government including any product feature enhancements.

PART 2 - PRODUCTS

2.1 GENERAL

- A. Coordinate features and select components to form an integrated system.
- B. Provide components and interconnections matched for optimum performance of specified functions.
- C. Equipment: Modular type, continuous duty rated.
- D. Weather-Resistant Equipment: Listed by a National Recognized Testing Laboratory (NRTL) for operation in damp or outdoor locations.

2.2 PERFORMANCE CRITERIA

- A. Provide functioning emergency call station system consisting of indoor or outdoor enclosures, stanchions, blue light and strobe lights, ADAAD compliant hands-free speakerphone communications devices and power supplies.
 - 1. Conform to VAAR 852.236.91 and intent indicated for complete emergency communications network, recognizing that work may be shown

in diagrammatic form or have been impracticable to detail all items because of variances in manufacturer's methods of achieving specified results.

- B. Provide integrated blue light and strobe to identify unit location.
 - 1. To call attention to location of emergency communication unit, Blue light must always be lit.
 - 2. When emergency instrument is activated, the strobe flashes at 1 million candlepower and 60 fpm to draw attention to the location.
 - 3. Strobe continuously flashes until actively terminated by personnel receiving the call.
- C. Provide systems firmware by OEM with a proven history of product reliability and sole control over all source code.
- D. Provide system with configuration programming capable of being executed remotely via a remote connection (when specifically accepted by Spectrum Management and COMSEC Services (SMCS 0050P2H3)) without any exchange of parts.

2.3 EMERGENCY CALL STATION

- A. Provide dual button ring down, ADAAD compliant, multi-function, high strength, vandal-resistant emergency instrument. Include high quality, and vandal-resistant, hands free communications device capable of mounting in an integrated wall mount enclosure assembly or free-standing emergency phone stanchion.
- B. Standard Features:
 - 1. Three number dialing capability.
 - 2. Programmable from a remote location.
 - 3. Two input relays.
 - 4. Two output relays.
 - 5. Remote speaker volume adjustment.
 - 6. Capable of playing two digitally stored voice messages.
 - 7. Programmable passwords.
 - 8. Capable of using interchangeable faceplates.
 - 9. Silent dial out.
 - 10. Output sound level >80 dB at 1 meter for normal conversation.
 - 11. Waterproof speaker.
 - 12. Waterproof microphone.
 - 13. Auto answer and auto shut-off.

14. Operating temperatures of -40 degrees to +65 degrees C (-40 degrees F to +150 degrees F).
 15. Conformal coated Speakerphone electronics to withstand harsh environments.
- C. Unit must have the following additional features:
1. Interface with facility's Emergency Voice Switching and Security Management System via "home run" communication cables.
 2. Vandal resistant stainless steel faceplate 12-gauge No.4 brushed stainless steel.
 3. Metal buttons.
 4. Phone line powered; no local power supply or battery backup required. Power provided by system headend unit.
 5. LED indicator for hearing impaired.
 6. Cast metal raised letter and Braille signage for ADAAD compliance.
 7. Auto-answer that allows security to monitor and initiate calls with Government provided phone.
 8. Auxiliary input and output programmable to integrate with video surveillance and security management system (SMS).
- D. Tamper-resistant Fasteners: Provide fasteners to enter unit only with proprietary wrench available from OEM of unit. Other types of fasteners will not be permitted for installation due to abundance of non-proprietary tools available for their removal.
- E. Rain and ice tight and insect resistant when assembled.
- F. When push button is activated:
1. Immediately and automatically dial security SMS console.
 2. Cause blue strobe light to flash.
 3. Activate output to associated video surveillance cameras.
 4. Provide visual indication, on Security Service's SMS Console Display Panels, to identify mapped location of activated unit.
- G. Connect via RJ-11 or RJ-45 plug to twisted pair phone line to SMS console and VoIP extension, when specifically accepted by SMCS 0050P2H3.
- H. Electrical:
1. Provide quick-disconnect terminals with plug and receptacle attachments for easy service or removal electrical components.
 2. Conceal wiring within unit so is not to be visible from outside.
 3. Provide 24 VAC under normal operation.

4. Surge protect dry pair telephone line and lightning ground entire unit.

2.4 BLUE STROBE LIGHTS

- A. Provide 1 million candlepower LED strobe light and a vivid blue area light, which serves to identify unit from great distances.
- B. Flash rate of no less than 60 flashes per minute
- C. Covered by a polycarbonate, prismatic refractor that distributes light in a horizontal pattern, making flash visible at great distances.
- D. Inaccessible to vandals.
- E. Weather resistant.
- F. Program to automatically activate when "Emergency" button is touched and flash until receiving party (SMS Console Operator) of call deactivates it. Strobe cannot be deactivated at unit.
- G. Provide 24VAC, 60Hz power for blue light, strobe, and faceplate light.
- H. Blue light and strobe must be controlled via emergency instrument by an auxiliary output.

2.5 STANCHION

- A. Wall Mount:
 1. 30.8 cm (12-1/8 inches) wide x 81.9 cm (32-1/4 inches) high x 19.1 cm (7-9/16 inches) deep.
 2. Vandal resistant, 2.5 mm (12-gauge) No.4 vertical brushed stainless steel designed to withstand prolonged exposure to harsh environments.
 3. Blue light and strobe mounting location at top of unit, housed in vandal resistant, blue polycarbonate refractor housing. This blue light and strobe further enclosed in a clear polycarbonate security enclosure.
 4. Weight: Maximum 34.01 kg (75 lbs.).
 5. Opening: Flush mount ADAAD-compliant, hands-free emergency instrument into wall mount enclosure.
 6. Mounting:
 - a. Fasten security call stations to wall with anchors and bolts as recommended by OEM or otherwise indicated.
 - b. Provide custom backbox from OEM to flush mount in path of egress as required by ADAAG.
- B. Free Standing:

1. Concentric steel cylinder (bollard) with a 222 mm (8-3/4 inch) diameter, a 6 mm (1/4 inch) wall thickness and a height of 2133 mm (84 inches).
2. Blue light and strobe located at top of unit with deep blue polycarbonate prismatic refractor that distributes light in a horizontal pattern, making the flash visible even at great distances.
3. Capability of mounting ADAAD-compliant, hands-free emergency instrument into pole mount housing.
4. Weight: Maximum 124.73 kg (275 lbs).
5. Secure free standing stanchions as shown on drawing details.

C. Graphics:

1. Cut from an engineering grade reflective vinyl for high visibility and legibility, with seven-year durability.
2. Provide standard graphics text "Emergency". In Standard colors reflective white, reflective blue and reflective black.

D. Finish:

1. Wall mounted stanchion: stainless steel uniform and free of visible and mechanical defects.
2. Free standing stanchion: Finished with a coating process graffiti, water, hostile environment and UV resistant.

2.6 SECURITY CALL STATION POWER SUPPLY

A. Provide power to operating and management console circuits and Multiple Call Instruments:

1. Steel, NEMA 1 rated enclosure.
2. AC power indicator with power On/Off switch with corresponding light.
3. 120 or 230 VAC selectable input.
4. 24VAC output.
5. Main fused input.
6. 10A current capacity.
7. Minimum 8 fused outputs.
8. Input wire size 12-16 gauge.
9. Output wire size 12-22 gauge stranded wire.

B. Security Call Station Cable:

1. Meet or exceed OEM's requirement.

2. Power cable: Minimum 14 AWG wire or as otherwise accepted home run from power supply to each call instruments.
3. Cables installed underground in underground conduits: Rated for direct burial installation.
4. Cables inside Building: Plenum rated in plenum spaces; riser rated in other areas.

2.7 UNINTERRUPTIBLE POWER SUPPLY (UPS)

- A. Provide a backup battery or a UPS for system head end at Security Service SMS console or its associated TR to allow normal operation and function (as if there was no AC power failure) in event of an AC power failure or during input power fluctuations for a minimum of one hour. Connect system to facility's Critical Generator Power Service.
 1. As an alternative solution, utilize facility telephone system UPS (if it is present) to meet this requirement at head end location, only when specifically accepted by COR.
 2. Obtain specific direction, in writing, from COR prior to any attachments or connection to facility's existing telephone system (if it exists).
- B. Provide UPS for active system components including:
 1. Head end.
 2. Master call instruments.
 3. Remote call instruments.
 4. Police SMS console.
 5. Emergency/Disaster control console (when made an extended control and monitoring part of system).

2.8 FINISHES

- A. Finishes for any exposed work such as plates, racks, panels, towers, enclosures, intercom stations, etc. must be accepted by design professional, COR and SMCS 0050P2H3.

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Review and coordinate with cabling trade contractor for location of security emergency call equipment in TRs.
- B. Before beginning work, verify location, quantity, size and access for the following:
 1. AC power circuits provided for systems.

2. Pull boxes, back boxes, wire troughs, cable trays/ladders, conduit stubs and other related infrastructure for systems.
3. System components installed by others.
4. Overhead supports and rigging hardware installed by others.
5. Telecommunications grounding busbar connected to telecommunications grounding system.
6. Immediately notify Government, general contractor and design professional of any discrepancies.

3.2 INSTALLATION

A. General:

1. Install work neatly, plumb and square and in a manner consistent with standard industry practice.
2. Protect work from dust, paint and moisture as dictated by site conditions. Contractor is responsible for protection of his work during construction phase up until final acceptance by Government.
3. Install equipment according to OEM's recommendations. Provide any hardware, adaptors, brackets, rack mount kits or other accessories recommended by OEM for correct assembly and installation.
4. Secure equipment firmly in place, including emergency call stations, stanchions, system cables, etc.
 - a. Support loads with mounts, fasteners, attachments and attachment points with a safety factor of at least 5:1.
 - b. Do not impose weight of equipment or fixtures on supports provided for other trades or systems.
 - c. Any suspended equipment or associated hardware must be certified by OEM for overhead suspension.
 - d. Contractor is responsible for means and methods in design, fabrication, installation and certification of any supports, mounts, fasteners and attachments.
5. Coordinate cover plates with field conditions. Size and install cover plates as necessary to hide joints between back boxes and surrounding wall. Where cover plates are not fitted with connectors, provide grommets in size and quantity required. Do not allow cable to leave or enter boxes without cover plates installed.
6. Cutting and Patching:
 - a. Patch and paint any wall or surface that has been disturbed by execution of work.

- b. Provide any additional cutting, drilling, fitting or patching required that is not indicated as provided by others to complete work or to make its parts fit together.
 - c. Do not damage or endanger a portion of Work, or partially completed construction of Government or separate contractors, by cutting, patching or otherwise altering such construction, or by excavation. Do not cut or otherwise alter such construction by Government or a separate contractor except with written consent of Government.
 - d. Where coring of in-place concrete is required, clearly identify location of such coring in the field and have location accepted by COR prior to commencement of coring.
7. Keep work areas clear of debris and clean daily at completion of work.

B. Wiring Practice:

1. Comply with requirements for raceways and boxes specified in Division 28, Section 28 05 33 RACEWAY AND BOXES FOR ELECTRICAL SYSTEMS.
2. Execute wiring in strict adherence to National Electrical Code, applicable local building codes and standard industry practices.
3. Classify wiring according to the following low voltage signal types:
 - a. Voice audio.
 - b. Low voltage DC control or power (less than 48VDC).
4. Where raceway is conduit, wiring of differing classifications must be run in separate conduit.
5. Where raceway is to be an enclosure (rack, tray, wire trough, utility box) wiring of differing classifications which share same enclosure must be mechanically partitioned and separated by minimum 102 mm (4 inches). Where cables of differing classifications cross, cross cabling perpendicular to one another.
6. Do not splice wiring anywhere along entire length of run.
7. Ensure cables are insulated and shielded from each other and from raceway for entire length of run.
8. Do not pull wire through any enclosure where a change of raceway alignment or direction occurs.
9. Do not bend wires to less than radius recommended by manufacturer.

10. Replace entire length of run of any wire or cable that is damaged or abraded during installation. There are no acceptable methods of repairing damaged or abraded wiring.
 11. Use wire pulling lubricants and pulling tensions recommended by OEM.
 12. Use grommets around cut-outs and knock-outs where conduit or chase nipples are not installed.
 13. Do not use tape-based or glue-based cable anchors.
 14. Ground shields and drain wires as indicated or recommended by OEM.
 15. Terminate field wiring entering equipment racks as follows:
 - a. Provide service loops at harness break-outs, plates, panels and equipment to allow plates, panels and equipment to be removed for service and inspection.
 - b. If specified terminal blocks are not designed for rack mounting, utilize 19 mm (3/4 inch) plywood or 3 mm (1/8 inch) thick aluminum plates/blank panels as a mounting surface.
 - c. Do not mount terminal block on bottom of rack.
 - d. Employ permanent strain relief for any cable with an outside diameter of 25.4 mm (1 inch) or greater.
 16. Make connections as follows:
 - a. Use mechanical connectors appropriate to application.
 - b. For crimp-type connections, use only tools that are specified by manufacturer for the application.
 - c. Use only insulated spade lugs on screw terminals. Size spade lugs to fit wire gauge; do not exceed two lugs per terminal.
 - d. Wire connectors or electrical tape connections are not permitted for any application.
- C. Cable Installation: In addition to mandatory infrastructure requirements provided under, Section 27 15 00, STRUCTURED CABLING, adhere to the following additional practices:
1. Support cable on maximum 610 mm (2 feet) centers. Acceptable means of cable support are cable tray or conduit. Wrap cable bundles loosely to cable tray with plenum rated hook and loop straps. Plastic tie wraps are not permitted as a means to bundle cables.
 2. Run cables parallel to walls.
 3. Do not lay cables on top of luminaires, ceiling tiles, mechanical equipment, or ductwork. Maintain 61 cm (2 feet) clearance from shielded electrical apparatus.

4. Test each cable after the total installation is complete. Document every test result including failures. Remedy any cabling problems or defects; this includes re-pull of new cable as required.
 5. Terminate cables on both ends per industry and OEM's recommendations.
 6. Provide proper temporary protection of cable after pulling is complete before final dressing and terminations are complete. Do not leave cable lying on floor. Bundle and tie wrap up off the floor until you are ready to terminate.
 7. Cold-Weather Installation: Bring cable to room temperature before de-reeling. Heat lamps are not permitted.
 8. Elude runs through structural members or cable in contact with pipes, ducts, or other potentially damaging items.
 9. Separation of Wires: (Refer to Raceway Installation)
 - a. Separate communications cable, and power wiring runs.
 - b. Install in separate raceways or, where exposed or in same enclosure, separate conductors at least 30.5 cm (12 inches) apart for adjacent parallel power and telephone wiring.
 - c. Separate other intercommunication equipment conductors as recommended by equipment manufacturer.
- D. Labeling:
1. Permanently mark switches, connectors, jacks, relays, receptacles and electronic and other equipment.
 2. Permanently label cables at each end, including intra-rack connections with, electronically printed labels of type which include a clear protective wrap.
 3. Provide printed labels at both ends of cables.
 4. Ensure equipment has appropriate NRTL Label, for product category it will perform. Equipment not bearing NRTL label will not be permitted as part of system, and contractor must provide listed replacement equipment with NRTL label.
- E. System Programming: Provide programming required for a complete and operational system. Coordinate programming parameters with COR and FMS Engineer.
- F. Fireproofing:
1. Fireproof the openings where cables penetrate fire rated walls, floors and ceilings.

2. Provide conduit sleeves (if not already provided by electrical contractor) for cables that penetrate fire rated walls. After cabling installation is complete, install fireproofing material in and around conduit sleeves and openings. Install fire proofing material thoroughly and neatly. Seal floor and ceiling penetrations.
3. Use only materials and methods that preserve integrity of fire stopping system and its rating.

G. Grounding:

1. Ground cable shields and equipment to eliminate shock hazard and to minimize ground loops, common mode returns, noise pickup, cross talk, and other impairments.
2. Provide telecommunications grounding system per Section 27 05 26, GROUNDING AND BONDING FOR COMMUNICATIONS SYSTEMS.

3.3 FIELD QUALITY CONTROL

A. Intermediate Testing:

1. After completion of 25 percent of installation of equipment, including one emergency call station, and prior to any further work, this portion of system must be pretested, inspected, and certified. Check each item of installed equipment to ensure appropriate NRTL labels are affixed, NFPA, Life Safety, and Joint Commission guidelines are followed, and proper installation practices are followed. Include a full operational test.
2. Arrange for inspection and test to be conducted by a factory-certified representative and witnessed by Government and SMCS 0050P2H3.
3. An identical inspection must be conducted between 65 and 75 percent of system construction phase; COR has authority to waive this requirement.

B. Pretesting:

1. Upon completing installation of system:
 - a. Align, balance, and pretest entire system under full operating conditions.
 - b. Verify (utilizing accepted test equipment) system is operational and meets performance requirements of this standard.
 - c. Verify that system functions are operational, and no unwanted aural effects, (i.e. signal distortion, noise pulses, glitches,

audio hum, poling noise, etc.) are present. Pretest each of the following locations:

- 1) Networked locations.
- 2) System trouble reporting.
- 3) System electrical supervision.
- 4) UPS operation.

2. Provide COR with recorded system pretest measurements and certification that system is ready for formal acceptance.

C. Acceptance Test:

1. After system has been pretested and contractor has submitted pretest results and certification to COR, schedule an acceptance test date by giving COR thirty days' written notice prior to date acceptance test is expected to begin. Include the duration of time for the test in the notification.
2. Test system in the presence of Government, SMCS 0050P2H3 and an OEM-certified representative.
3. Test utilizing accepted test equipment to certify proof of performance.
4. Perform only operator adjustments required to show proof of performance during test.
5. Demonstrate and verify that installed system complies with requirements of this section, under operating conditions.
6. Rate system as either acceptable or unacceptable at conclusion of test.
7. Terminate acceptance test of system for failure of any part of system that precludes completion of system testing, and which cannot be repaired in four hours. For repeated failures that result in a cumulative time of eight hours to affect repairs, Government will declare entire system to be unacceptable.
8. Reschedule retesting of unacceptable systems at the convenience of Government.

D. Acceptance Test Procedure:

1. Physical and Mechanical Inspection:
 - a. Prepare a system inventory including available spare parts. Check each item of installed equipment to ensure appropriate NRTL certification labels are affixed.

- b. Formally inventory and review system diagrams, record drawings, equipment manuals, electronic drawing files, intermediate, and pretest results on portable storage drives.
 - c. Terminate testing for failure of system to meet requirements of this section.
2. Operational Test:
- a. After physical and mechanical inspection, check equipment to verify system meets performance requirements. Use sound level meter to accomplish this requirement.
 - b. Individual Item Test: Government will select individual items of equipment for detailed proof of performance testing until 100 percent of system is tested and found to meet or exceed minimum requirements of specifications.
3. Test Conclusion: Government will accept results of the test or require additional testing on reported deficiencies and shortages. Retesting to comply with these specifications must be done at Government's convenience and contractor's expense.

E. Acceptable Test Equipment:

- 1. Provide test equipment with a calibration tag of an acceptable calibration service dated not more than twelve months prior to test.
- 2. As part of submittal, a test equipment list must be furnished that includes make and model number of the following type of equipment:
 - a. Telephone Test Set.
 - b. Signal Level Meter.
 - c. Volt-Ohm Meter.
 - d. Sound Pressure Level (SPL) Meter.

3.4 CLEANING

- A. Prior to final inspection and acceptance of work, remove debris, rubbish, waste material, tools, construction equipment, machinery and surplus materials from project site and thoroughly clean work area.

3.5 TRAINING

- A. Provide thorough training of security staff assigned to units receiving communications from emergency call station system equipment. Implement training from security console officer's perspective, and likewise, for any person whose specific responsibilities include answering emergency calls and dispatching security response, provide operational training from their perspective. Use a separate training room that allows this

type of individualized training utilizing an in-service training unit, prior to cut over of new system.

B. Provide the following minimum training:

1. 4 hours during opening week for security staff - both day and night shifts.
2. 4 hours for supervisors and system administrators.

3.6 MAINTENANCE

A. Provide COR the ability to contact contractor and OEM's central emergency assistance maintenance center and request remote diagnostic testing and assistance in resolving technical problems at any time, during warranty period. Provide remote diagnostic testing and logistic assistance capability to Government.

B. Response Time, during Warranty Period, for Security Emergency Call System Trouble Calls:

1. A standard work week is considered 8:00 A.M. to 5:00 P.M., Monday through Friday exclusive of Federal holidays.
2. Respond and correct on-site trouble calls, during the standard work week:
 - a. A routine trouble is considered a trouble which reports a single station or interface point is inoperable. Routine trouble call within one working day (12 hours) of its report.
 - b. An emergency trouble is considered a trouble which causes a sub system (ward), distribution point, terminal cabinet, to be inoperable at any time. Emergency trouble call within two hours of its report.
 - c. A catastrophic trouble is considered a trouble which a major portion of system fails; or, an entire system failure has happened. Catastrophic trouble call within one hour of it report.

- - - E N D - - -