

# CAIS STANDARD MANUAL

## SYSTEM NO. 11 BUILDING OTHER ELECTRICAL SYSTEMS

EXEMPTION STATEMENT A

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CAIS MANUAL

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3. If you have questions about these documents, please contact Andrew Poulis at DSN 523-6285.

  
LARRY L. TESTERMAN  
Scientific and Technical  
Information Program Manager

Atchs: Manuals

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**11 BUILDING OTHER ELECTRICAL SYSTEMS**


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## 11 BUILDING OTHER ELECTRICAL SYSTEMS

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### ABSTRACT

#### GENERAL ORGANIZATION

At this installation the list of facilities to be surveyed, including infrastructure, will be addressed on the basis of 32 unique systems that form the CAIS Engineering Deficiency Standards and Inspection Methods document. Each system deals with a specific technical aspect of the facility to be surveyed. Within each system a further breakdown is made to subsystems, each having a related list of components. Detailed observations of the listed defects are provided so as to allow the entry of observed quantification data. A DOD CAIS manual is provided for each of the 32 systems with an internal organization as outlined below:

#### INSPECTOR'S GUIDE

- I. General
  - A. Level I Inspection Method Description
  - B. Level II Inspection Method Description
  - C. Level III Inspection Method Description
- II. General Inspection
  - A. Process. This section describes the process of the inspection activity.
  - B. Location. This section describes the procedure for locating the inspection units in the facility or infrastructure on this installation.
- III. Inspector Qualifications

This section notes the minimum qualifications for the person or persons performing the survey.
- IV. Inspection Unit

This section describes how the IU (Inspection Unit) is determined for the particular component being surveyed.
- V. Unit Costs

This section notes the nature of repair costs for this system.
- VI. Standard Safety Requirements

This section lists safety procedures and equipment required to implement a safe environment for the conduct of this survey.
- VII. Standard Tools

This section lists a set of standard tools required for the general conduct of this survey.
- VIII. Special Tools and Equipment Requirements

This section refers to special tools or equipment requirements endemic to the nature of the system being surveyed.

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## 11 BUILDING OTHER ELECTRICAL SYSTEMS

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### IX. Level II Inspection Method Keys

This section explains the use of keys as they relate to Level II Guide Sheets.

### X. Level III Inspection Method Keys

This section explains the use of keys as they relate to Level III Guide Sheets.

### XI. Replacement Cost

This section describes the nature and location of replacement cost data.

### XII. Appendices

Appendix A. Provides a listing and definition of all abbreviations used both in the Standards and in the data base.

Appendix B. Provides a glossary of terms with their definitions as used in the Standard.

Appendix C. This section contains a listing of the average life cycle durations for each assembly\* in the Standard.

- \* Assembly is a term describing the level at which replacement rather than repair occurs. This can be at the subsystem or component designation, depending on the system being surveyed.

## SYSTEM TREE

The System Tree is a graphical representation of the Work Breakdown Structure, showing system, subsystem and component relationships for the Building Other Electrical System.

## INSPECTION METHODS

### Description

Describes the nature of what is to be condition surveyed.

### Special Tool and Equipment Requirements

Lists any special tools required for this specific subsystem.

### Special Safety Requirements

This section outlines any special safety measures or equipment required for this specific subsystem so as to maintain a safe environment and process in the conduct of the condition survey.

### Component List

All components to be surveyed under this subsystem are listed here.

### Related Subsystems

All other subsystems that have a survey relationship to this subsystem are listed here to help coordinate a complete and thorough condition assessment survey.

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## 11 BUILDING OTHER ELECTRICAL SYSTEMS

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### Standard Inspection Procedure

This statement indicates the various levels of survey effort required for this subsystem.

### Components

The previously listed components of this subsystem are described with a survey procedure recommended on a component by component basis. For each component there is a listing of defects with each defect broken down into observations describing the nature and severity of the defective condition observed. The surveyor enters a quantification value for each defect/observation encountered in the field CAIS device (DCD) to record the result of his survey.

### References

This page lists the reference sources from which the foregoing subsystem data was developed.

### Guide Sheet Control Number

This section lists the key numbers that tie the written Level II and Level III guide sheets to specific components in this subsystem.

### Level II and Level III Inspection Method Guide Sheets

This section contains the detailed descriptions of the Level II and III survey and inspection procedures for this subsystem.

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## 11 BUILDING OTHER ELECTRICAL SYSTEMS

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### INSPECTOR'S GUIDE

#### I. GENERAL

##### A. Level I Inspection Method

The Level I Inspection Method of building other electrical systems consists of a thorough inspection of the above ground portions of the system. The survey activity is designed to be performed by a single surveyor.

##### B. Level II Inspection Method

Level II inspections are triggered by defect/observations noted at the Level I inspection or in some cases, are required to conduct a meaningful survey of the component being surveyed. There are only a few Level II inspections in Building Other Electrical Systems. They occur typically where access to the component being surveyed is required through a panel cover or other access device. Level II inspections are referenced by defect/observations through a "Level II key", which denotes a specific Guide Sheet that describes the Level II inspection activity.

##### C. Level III Inspection Method

The Level III inspection is triggered by defect/observations occurring in the Level I and II inspections. The Level III inspection can also occur as a result of time based scheduling, antidotal experience, or component age compared to its life cycle. The Level III inspection is referenced through a Level III key which in turn, denotes a specific Guide Sheet describing the Level III inspection process and requirements. Level III inspections produce a detailed, written engineering assessment of the deficiency along with an estimated cost of correction, and are performed at the option of the Facility Manager.

#### II. GENERAL INSPECTION

##### A. Process

Surveys are normally conducted at the component level. Figure 11-A provides the breakdown from system through component for the Building Other Electrical Systems. The surveyor will work through the Work Breakdown Structure (WBS) to conduct the inspection. At the component level the surveyor will be provided a list of defects, each of which is described further in detail as observations. These observations are described to various levels of severity as they relate to the effect of the life of the system. The quantification of each deficiency is identified by the surveyor using the associated unit of measure. Once an observation is populated with a deficient quantity, the inspector will be requested to provide information on the component type and location. In some cases, the UOM for the component will be different than the UOM for the defect. For example, corrosion is measured in square feet (SF) and the component, TV Monitors/Cameras, is measured by each occurrence (EA). In these cases, the inspector will be asked for the "Total Quantity" which represents the total surface area of the TV Monitor/Camera which could have had corrosion if the corroded area covered a 100% of the metal.

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## 11 BUILDING OTHER ELECTRICAL SYSTEMS

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Multiple defects may exist at the component level, within an IU. Defect quantities are captured by the inspector for each occurrence within a discrete IU. When multiple defects exist on the same IU, the inspector must quantify the total amount affected by each observation for that IU. In cases where defects overlap an affected area, the inspector will quantify the more severe defect of the overlapping area and the remaining affected area is recorded for the less severe defect.

Once all the observations for a component are populated with the appropriate defect quantities, the inspector must close-out the component on Field CAIS. This allows Field CAIS to apply the gathered information to a singularly defined component. The next subsequent observation will retain the IU/Location/Type information from the previous entry. The inspector may accept this information or change any portion of it. The installation date or age of the component may be preloaded into the WBS for each asset from the Real Property Inventory List or site specific information. If necessary, age data can be overridden by the surveyor, Site CAIS personnel, or the Facility Manager.

### **B. Location**

Facility Manager furnished building drawings, floor plans, or surveyor-prepared schematics or sketches are required to ensure a complete inspection of all areas and to assist in the location of IU's. The inspection team members must use the recommended room numbering schemes for the installation. The installation may have rooms physically identified by a numbering system or identified on floor plans. If both exist and are different, the Facility Manager will develop guidance on which numbering system takes precedence. Where numbering systems do not exist or are not complete in identifying each space, specific guidance for the inspector to annotate areas in a consistent manner should be developed by the Facility Manager and implemented in the installations CAS process. All plans should be oriented with a north arrow to the top of the drawing. This will help describe the specific location of some IU's.

The key to utilizing the floor plans for locating IU's is that each area is identified consistently between the field inspection team members; also, the floor plan that is being utilized is captured as a drawing file number in Field CAIS. The drawing then becomes a part of the CAS process and should be utilized in future inspections to assure repeatability.

### **III. INSPECTOR QUALIFICATIONS**

The minimum Inspector qualification for Building Other Electrical Systems requires a five year journeyman. Experience or familiarity in the areas of wiring, EMS and security systems is desirable but not required. All of the condition survey requirements for this system can be accomplished at the Level I inspection by a single inspector, however, safety and other considerations may require that inspectors work in teams. Inspectors will be specifically trained in the CAS system and its usage and will be CAS certified in the "Electrical" discipline.

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## 11 BUILDING OTHER ELECTRICAL SYSTEMS

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### IV. INSPECTION UNIT (IU)

The Inspection Unit (IU) is defined at the component level. Inspection Units are always located and quantified by the inspector. Deficiencies and observations are always tied to the IU and are not independently located.

IU's for the Building Other Electrical System are measured by individual occurrences (EA). IU's are typically composed of individual sensors, remote terminals, monitors, transmitters, etc. with each occurrence constituting a new IU.

Any unusual conditions pertaining to the IU should also be noted in Field CAIS, when the IU is defined. This may include information that should be noted for the Facility Manager's use, regarding life/health/safety, containment, environment, or degree of difficulty. Other optional information may also be entered to further describe the IU.

### V. UNIT COSTS

The unit costs that are applied to the quantities recorded for each observation are contained within the Site CAIS as repair cost.

### VI. STANDARD SAFETY REQUIREMENTS

The Master Safety Plan will be followed at all times during the condition survey.

Inspector may utilize the following protective gear:

- Hard hat - to be worn during all surveys
- Safety glasses - to be worn during all surveys
- Safety shoes - to be worn during all surveys
- Coveralls - to be worn as necessary
- Gloves - to be worn as necessary
- Ear plugs - to be worn in designated areas
- Knee pads - to be worn when crawling is required
- Rain suit - to be worn as necessary
- Wet suit - to be worn as necessary

### VII. STANDARD TOOLS

Employee Identification Card - to be worn or carried during all survey activities

Data Collection Device (DCD)

Battery pack for DCD

Flashlight

Tape measure - 30'

Rule - 6'

Tool bag

Screwdrivers -

Phillips

Straight slot

Knife

Pliers

8' Extension Ladder

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## 11 BUILDING OTHER ELECTRICAL SYSTEMS

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### VIII. SPECIAL TOOLS AND EQUIPMENT REQUIREMENTS

At the subsystem level, the deficiency standard has identified special tools and equipment required for the standard inspection of the associated components, which exceed the standard tools identified for the system. Level III Inspection Method Guide Sheets will address additional tools and equipment requirements that are specific to that particular advanced method of inspection.

Facility Managers should review these sections in order to determine any special tool requirements for subsystems that are to be surveyed.

### IX. LEVEL II INSPECTION METHOD KEYS

Certain observations will reference a Level II Inspection Method. The Facility Manager will be able to identify deficiencies where a Level II inspection is flagged. The Level II key at the observation level will refer to a specific guide sheet.

All Level II Guide Sheets are located at the end of each Subsystem section. A Guide Sheet Reference page precedes Level II and Level III Guide Sheets.

### X. LEVEL III INSPECTION METHOD KEYS

Certain observations will trigger a Level III inspection. The Facility Manager will be able to identify deficiencies where a Level III inspection is flagged. The Level III Key at the observation level will refer to a specific guide sheet. These guide sheets may refer the Facility Manager to a more sophisticated and costly test method.

All Level III Guide Sheets are located at the end of each Subsystem section. A Guide Sheet Reference page precedes Level II and Level III Guide Sheets.

### XI. REPLACEMENT COST

A replacement cost for each assembly\* type will be contained within the cost estimating system in the Site CAIS.

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## 11 BUILDING OTHER ELECTRICAL SYSTEMS

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### XII. APPENDICES

#### **Appendix A - Abbreviations**

A summary and definition of all abbreviations used in this system are contained in Appendix A which is located at the end of Building Other Electrical Systems.

#### **Appendix B - Glossary**

A glossary of terms used in this system are contained in Appendix B which is located at the end of Building Other Electrical Systems.

#### **Appendix C - Life Cycles**

A listing of the average life cycle durations for each assembly\* in the Standard.

#### **Note - Facility Manager's Guide**

The following are included in the Facility Manager's Guide:

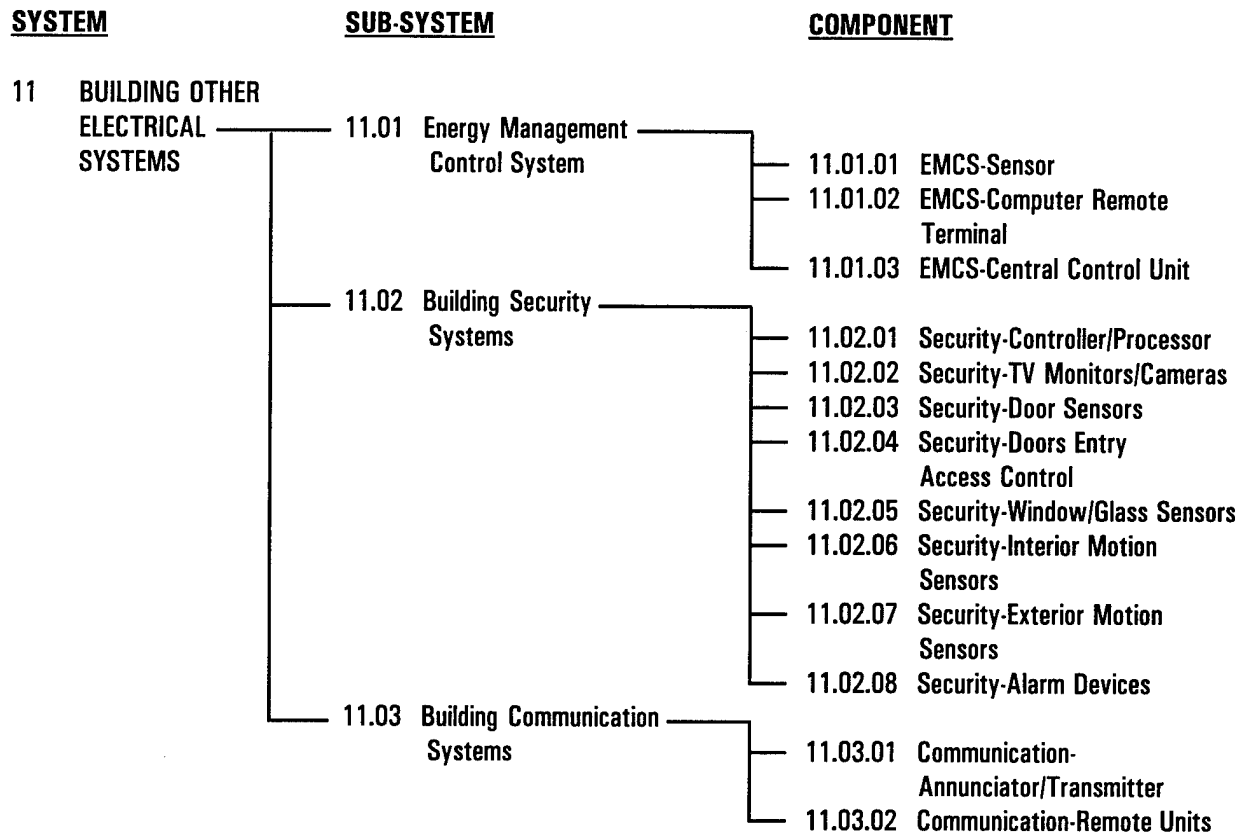
A table showing the required manhours to perform the standard inspection for this facility listed by Cat Code (three digit).

A listing of all Level III inspections with their estimated cost and time to perform. This list will include frequency of inspection for time driven Level III's.

\* Assembly is a term describing the level at which replacement rather than repair occurs. This can be at the subsystem or component designation, depending on the system being surveyed.

## 11 BUILDING OTHER ELECTRICAL SYSTEMS

Figure 11-A. WORK BREAKDOWN STRUCTURE



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## 11.01 ENERGY MANAGEMENT CONTROL SYSTEM

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### DESCRIPTION

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The Energy Management Control System (EMCS) is a network of electrical components made up of a central control unit, sensors, and computer remote terminal (CRT). The system is used to monitor, control and change the operation of the energy using equipment in a building. The central control unit receives a signal from a sensing device through remote terminals and the information can be displayed on a monitor screen (CRT) where the data can be analyzed and adjusted if required.

### SPECIAL TOOL AND EQUIPMENT REQUIREMENTS

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No special tools are needed for the inspection of the EMCS, beyond the requirements listed in the Building Other Electrical Standard Tools Section.

### SPECIAL SAFETY REQUIREMENTS

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No special safety requirements are needed for the inspection of the EMCS, beyond the requirements listed in the Master Safety Plan and System Safety Section.

### COMPONENT LIST

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- ◆ 11.01.01 EMCS - SENSORS
- ◆ 11.01.02 EMCS - COMPUTER REMOTE TERMINAL
- ◆ 11.01.03 EMCS - CENTRAL CONTROL UNIT

### RELATED SUBSYSTEMS

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Due to the related nature of the elements requiring inspection, the following DS/IM's should be reviewed for concurrent inspection activities.

- |       |                                      |
|-------|--------------------------------------|
| 10.00 | BUILDING ELECTRICAL (all subsystems) |
| 08.00 | BUILDING MECHANICAL (all subsystems) |

### STANDARD INSPECTION PROCEDURE

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The standard inspection procedure for this subsystem is a visual inspection of each Energy Management Control System, augmented by a Level II Inspection when required. Very few Level II or III inspection keys are indicated for the EMCS subsystem. Some inspections may require the inspector to utilize a ladder or similar device to observe defect/observations above the inspectors normal line of sight. The inspection should be carried out in order of presentation of the various components. Associated defects and observations are listed which will be presented in the inspector's Data Collection Device (DCD).

The Inspection Unit (IU) is defined at the subsystem level and composed of the discrete components within the EMCS system. If the inspector can determine that more than one EMCS is operating within a facility, then a separate IU should be established for each system.

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## 11.01 ENERGY MANAGEMENT CONTROL SYSTEM

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### COMPONENTS

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#### ◆ 11.01.01 EMCS - SENSOR

Sensors are devices which commonly sense temperature, humidity, electrical demand, smoke, air pressure, air flow, light levels, etc. These sensors are located at points from which a signal is required to evaluate and readjust the overall operation for the building relative to building energy use and operating costs.

Defect:	UOM	LEVEL II KEY	LEVEL III KEY
* <b>Physical Damage:</b> (caused by impact damage, use, and environmental location) Observation:			
a. Loose, worn, or misaligned parts. Requires tightening or adjusting. *** {Severity L}	EA		
b. Broken or missing parts. (Sensor still functions) *** {Severity M}	EA		
c. Broken or missing parts. (Sensor does not work). *** {Severity H}	EA		
Defect:			
* <b>Sensor working improperly:</b> Observation:			
a. Sensor improperly working. (Determined by communication with building supervisor). *** {Severity H}	EA		1

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## 11.01 ENERGY MANAGEMENT CONTROL SYSTEM

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### COMPONENTS (Continued)

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#### ◆ 11.01.02 EMCS - COMPUTER REMOTE TERMINAL

The Computer Remote Terminal (CRT) is an interconnecting device that receives signals from all types of sensors and transmits same to the central control panel where the data is processed and displayed on a monitor screen. Corrective and adjustment signals are sent from the central control panel to the computer remote terminal for distribution to the actuators controlling valves, dampers, relays, speed controllers, lighting controllers, etc.

Defect:	UOM	LEVEL II KEY	LEVEL III KEY
* <b>Physical Damage:</b> (caused by impact damage, use, and environmental location) Observation:			
a. Loose, worn, or misaligned parts. Requires tightening or adjusting. *** {Severity L}	EA		
b. Broken or missing parts. (Unit still functions). *** {Severity M}	EA		
c. Broken or missing parts. (Unit not functioning). *** {Severity H}	EA		2
Defect:			
* <b>CRT Working Improperly:</b> Observation:			
a. CRT determined to be improperly working. (Based on communication with building supervisor). *** {Severity H}	EA		2

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## 11.01 ENERGY MANAGEMENT CONTROL SYSTEM

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### COMPONENTS (Continued)

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#### ◆ 11.01.03 EMCS - CENTRAL CONTROL UNIT

The Central Control Unit (CCU) is a computerized building management system designed to control heating and air conditioning equipment and other energy consuming loads within a building. It serves as a central controller which receives signals from the sensors through the computer remote terminals and utilizes its programmed logic to determine if operating changes are to be made or that the system should continue operate as programmed.

Defect:	UOM	LEVEL II KEY	LEVEL III KEY
---------	-----	-----------------	------------------

**\* Physical Damage:**

(caused by impact damage, use,  
and environmental location)

Observation:

a. Loose, worn, or misaligned parts. Requires tightening or adjusting.	EA		
---	----	--	--

\*\*\* {Severity L}

b. Broken or missing parts. (Unit still functions).	EA		
--	----	--	--

\*\*\* {Severity M}

c. Broken or missing parts. (Unit not functioning).	EA		3
--	----	--	---

\*\*\* {Severity H}

**Defect:**

**\* CCU Working Improperly:**

Observation:

a. CCU working improperly. (Based on communication with building supervisor).	EA		3
---	----	--	---

\*\*\* {Severity H}

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## 11.01 ENERGY MANAGEMENT CONTROL SYSTEM

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### REFERENCES

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1. Building Construction Materials and Types of Construction, D. C. Ellison, W. C. Huntington, R.E. Mickadeit, John Wiley & Sons, Inc., Sixth Edition, 1987
2. Means Building Construction Cost Data, R. S. Means, 52nd Edition, 1994
3. Means Illustrated Construction Dictionary, R. S. Means, 1994
4. NASA Facilities Maintenance Handbook, NHB 8831.2, 1991
5. Energy Management, Fire and Security Control Systems, DeltaNet, Honeywell, Inc. 1989
6. Electric and Electronic Controls, Honeywell, Inc. 1989
7. Energy Management and Controls, Johnson Controls Inc. 1990

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## 11.01 ENERGY MANAGEMENT CONTROL SYSTEM

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<b>LEVEL II KEY</b>	<b>GUIDE SHEET CONTROL NUMBER</b>
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N/A

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<b>LEVEL III KEY</b>	<b>GUIDE SHEET CONTROL NUMBER</b>
----------------------	-----------------------------------

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- |   |                   |
|---|-------------------|
| 1 | GS-III 11.01.01-1 |
| 2 | GS-III 11.01.02-2 |
| 3 | GS-III 11.01.03-3 |

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**LEVEL III INSPECTION METHOD GUIDE SHEET**

---

**LEVEL III GUIDE SHEET - KEY NO. 1**

---

**COMPONENT:** EMCS - SENSORS  
**CONTROL NUMBER:** GS-III 11.01.01-1

**Application**

This guide applies to investigation of improper operation of the Energy Management Control System (EMCS) sensors. Improper sensors operation may be due to impact damage, wear and/or use and electrical deficiencies.

**Special Safety Requirements**

Inspections of sensors may present hazards in examining electrical components. Caution should be used in inspecting and operating this special electrical control devices. Additional general safety requirements for the performance of the Level III inspection are contained in the Master Safety Plan and System Safety Section.

**Inspection Action**

Level III inspection requires the expertise of an individual that is trained in the inspection and operation of the special EMCS and electrical control systems to further assess the extent of the component defect.

1. Review facility data files (Operation & Maintenance Manuals) to determine manufacture and technical specification related to the sensors.
2. Analyze inspection data from Level I inspection, in conjunction with Operation & Maintenance Manuals, to determine whether further inspection should be performed, and if so, by in-house technical capabilities or manufacture's representative.
3. Order inspection to be completed to determine extent and cost associated with correcting the deficiency.

**Special Tools and Equipment Requirements**

Electrical Testing Equipment as required.

**Recommended Inspection Frequency**

There is no standard frequency prescribed for this component. The Level III inspection is activated by deficiencies observed during the Level I and/or Level II inspections.

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**LEVEL III INSPECTION METHOD GUIDE SHEET**

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**LEVEL III GUIDE SHEET - KEY NO. 1 (Continued)**

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**COMPONENT:** EMCS - SENSORS  
**CONTROL NUMBER:** GS-III 11.01.01-1

**References**

1. Energy Management, Fire and Security Control Systems, DeltaNet, Honeywell, Inc. 1989
2. Electric and Electronic Controls, Honeywell, Inc. 1989
3. Energy Management and Controls, Johnson Controls Inc. 1990

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**LEVEL III INSPECTION METHOD GUIDE SHEET**

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**LEVEL III GUIDE SHEET - KEY NO. 2**

---

**COMPONENT:** EMCS - COMPUTER REMOTE TERMINAL  
**CONTROL NUMBER:** GS-III 11.01.02-2

**Application**

This guide applies to investigation of improper operation of the Energy Management Control System (EMCS) CRT units. Improper CRT operation may be due to impact damage, wear and/or use and electrical deficiencies.

**Special Safety Requirements**

Inspections of CRT may present hazards in examining electrical components. Caution should be used in inspecting and operating this special electrical control devices. Additional general safety requirements for the performance of the Level III inspection are contained in the Master Safety Plan and System Safety Section.

**Inspection Action**

Level III inspection requires the expertise of an individual that is trained in the inspection and operation of the special EMCS and electrical control systems to further assess the extent of the component defect.

1. Review facility data files (Operation & Maintenance Manuals) to determine manufacture and technical specification related to the CRT.
2. Analyze inspection data from Level I inspection, in conjunction with Operation & Maintenance Manuals, to determine whether further inspection should be performed, and if so, by in-house technical capabilities or manufacture's representative.
3. Order inspection to be completed to determine extent and cost associated with correcting the deficiency.

**Special Tools and Equipment Requirements**

Electrical Testing Equipment as required.

**Recommended Inspection Frequency**

There is no standard frequency prescribed for this component. The Level III inspection is activated by deficiencies observed during the Level I and/or Level II inspections.

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**LEVEL III INSPECTION METHOD GUIDE SHEET**

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**LEVEL III GUIDE SHEET - KEY NO. 2 (Continued)**

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**COMPONENT:** EMCS - COMPUTER REMOTE TERMINAL  
**CONTROL NUMBER:** GS-III 11.01.02-2

**References**

1. Energy Management, Fire and Security Control Systems, DeltaNet, Honeywell, Inc. 1989
2. Electric and Electronic Controls, Honeywell, Inc. 1989
3. Energy Management and Controls, Johnson Controls Inc. 1990

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**LEVEL III INSPECTION METHOD GUIDE SHEET**

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**LEVEL III GUIDE SHEET - KEY NO. 3**

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**COMPONENT:** EMCS - CENTRAL CONTROL UNITS  
**CONTROL NUMBER:** GS-III 11.01.03-3

**Application**

This guide applies to investigation of improper operation of the Energy Management Control System (EMCS) CCU'S. Improper CCU operation may be due to impact damage, wear and/or use and electrical deficiencies.

**Special Safety Requirements**

Inspections of CCU may present hazards in examining electrical components. Caution should be used in inspecting and operating this special electrical control devices. Additional general safety requirements for the performance of the Level III inspection are contained in the Master Safety Plan and System Safety Section.

**Inspection Action**

Level III inspection requires the expertise of an individual that is trained in the inspection and operation of the special EMCS and electrical control systems to further assess the extent of the component defect.

1. Review facility data files (Operation & Maintenance Manuals) to determine manufacture and technical specification related to the Central Control Unit (CCU).
2. Analyze inspection data from Level I inspection, in conjunction with Operation & Maintenance Manuals, to determine whether further inspection should be performed, and if so, by in-house technical capabilities or manufacture's representative.
3. Order inspection to be completed to determine extent and cost associated with correcting the deficiency.

**Special Tools and Equipment Requirements**

Electrical Testing Equipment as required.

**Recommended Inspection Frequency**

There is no standard frequency prescribed for this component. The Level III inspection is activated by deficiencies observed during the Level I and/or Level II inspections.

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**LEVEL III INSPECTION METHOD GUIDE SHEET**

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**LEVEL III GUIDE SHEET - KEY NO. 3 (Continued)**

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**COMPONENT:** EMCS - CENTRAL CONTROL UNITS  
**CONTROL NUMBER:** GS-III 11.01.03-3

**References**

1. Energy Management, Fire and Security Control Systems, DeltaNet, Honeywell, Inc. 1989
2. Electric and Electronic Controls, Honeywell, Inc. 1989
3. Energy Management and Controls, Johnson Controls Inc. 1990

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## 11.02 BUILDING SECURITY SYSTEMS

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### **DESCRIPTION**

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The Building Security System is a network of electrical/electronic equipment consisting of one or more of the following units: TV monitor/cameras, door sensors, door entry access controllers, glass sensors, motion sensors, exterior motion sensors and alarm devices, etc. The network of equipment is commonly connected by cable to a central control unit and provides control of authorized access and occupancy of a building or specified areas within a building.

### **SPECIAL TOOL AND EQUIPMENT REQUIREMENTS**

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No special tools are needed for the inspection of the Building Security System, beyond the requirements listed in the Building Other Electrical Standard Tools Section.

### **SPECIAL SAFETY REQUIREMENTS**

---

No special safety requirements are needed for the inspection of the Building Security System, beyond the requirements listed in the Master Safety Plan and System Safety Section.

### **COMPONENT LIST**

---

- ◆ 11.02.01 SECURITY - CONTROLLER/PROCESSOR
- ◆ 11.02.02 SECURITY - TV MONITORS/CAMERAS
- ◆ 11.02.03 SECURITY - DOOR SENSORS
- ◆ 11.02.04 SECURITY - DOORS ENTRY ACCESS CONTROL
- ◆ 11.02.05 SECURITY - WINDOW/GLASS SENSORS
- ◆ 11.02.06 SECURITY - INTERIOR MOTION SENSORS
- ◆ 11.02.07 SECURITY - EXTERIOR MOTION SENSORS
- ◆ 11.02.08 SECURITY - ALARM DEVICES

### **RELATED SUBSYSTEMS**

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Due to the related nature of the elements requiring inspection, the following DS/IM's should be reviewed for concurrent inspection activities.

- |       |                                      |
|-------|--------------------------------------|
| 03.02 | EXTERIOR DOORS                       |
| 03.03 | EXTERIOR WINDOW                      |
| 05.03 | INTERIOR DOORS                       |
| 05.04 | INTERIOR WINDOW                      |
| 10.00 | BUILDING ELECTRICAL (all subsystems) |

## 11.02 BUILDING SECURITY SYSTEMS

### STANDARD INSPECTION PROCEDURE

The standard inspection procedure for this subsystem is a visual inspection of each Building Security System, augmented by a Level II Inspection when required. Very few Level II or III inspection keys are indicated for the Building Security System subsystem. Some inspections may require the inspector to utilize a ladder or similar device to observe defect/observations above the inspectors normal line of sight. The inspection should be carried out in order of presentation of the various components. Associated defects and observations are listed which will be presented in the inspector's Data Collection Device (DCD).

The Inspection Unit (IU) occurs at the assembly level and is identified for each security system present. If more than one security system are present (example: badge access system and night/perimeter security) they should be identified as separate Inspection Units.

### COMPONENTS

#### ◆ 11.02.01 SECURITY - CONTROLLER/PROCESSOR

The controller-processor is a recessed or surface mounted sheet metal enclosure which houses electronic equipment, relays and terminals required to receive signals from all remote sensors. The controller-processor normally has a battery back-up system to ensure continuous operation during primary power loss.

Defect:	UOM	LEVEL II KEY	LEVEL III KEY
* <b>Physical Damage:</b> (caused by impact damage, use, and environmental location)			
Observation:			
a. Loose, worn, or misaligned parts. Requires tightening or adjusting. *** {Severity L}	EA		
b. Broken or missing parts. (Controller/processor still functions). *** {Severity M}	EA		
c. Broken or missing parts. (Controller/processor not functioning). *** {Severity H}	EA		1
Defect:			
* <b>Controller/Processor Working Improperly:</b>			
Observation:			
a. Controller/processor determined to be improperly working. (Based on communication with building supervisor). *** {Severity H}	EA		1

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## 11.02 BUILDING SECURITY SYSTEMS

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### COMPONENTS (Continued)

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#### ◆ 11.02.02 SECURITY - TV MONITORS/CAMERAS

This system is a network of video cameras and TV monitors which are utilized to observe activity within a building from a centralized location. The system also can monitor exterior gates and openings as well as areas surrounding buildings.

Defect:	UOM	LEVEL II KEY	LEVEL III KEY
* <b>Physical Damage:</b> (caused by impact damage, use, and environmental location)			
Observation:			
a. Loose, worn, or misaligned parts. Requires tightening or adjusting. *** {Severity L}	EA		
b. Broken or missing parts. (Monitor/camera still functions). *** {Severity M}	EA		
c. Broken or missing parts. (Monitor/camera not functioning). *** {Severity H}	EA		2
* <b>TV/Camera Working Improperly:</b>			
Observation:			
a. TV/Camera working improperly. (Based on communication with building supervisor). *** {Severity H}	EA		2

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## 11.02 BUILDING SECURITY SYSTEMS

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### COMPONENTS (Continued)

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#### ◆ 11.02.03 SECURITY - DOOR SENSORS

A door sensor is a set of magnetic contacts that completes an electrical circuit as long as the door is in a secured position. When the contacts are separated the electrical circuit is broken, which sends a signal to the controller/processor, which will activate the alarm device.

Defect:	UOM	LEVEL II KEY	LEVEL III KEY
<p><b>* Physical Damage:</b> (caused by impact damage, use, and environmental location)</p> <p>Observation:</p>			
a. Loose, worn, or misaligned parts. Requires tightening or adjusting. *** {Severity L}	EA		
b. Broken or missing parts. (Sensor still functions). *** {Severity M}	EA		
c. Broken or missing parts. (Sensor not functioning). *** {Severity H}	EA		3
<p><b>Defect:</b></p> <p><b>* Door Sensor Working Improperly:</b> Observation:</p>			
a. Sensor is determined to be improperly working, gives false readings, works intermittently, etc (Based on examination and communication with building supervisor). *** {Severity H}	EA		3

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## 11.02 BUILDING SECURITY SYSTEMS

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### COMPONENTS (Continued)

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#### ◆ 11.02.04 SECURITY - DOORS ENTRY ACCESS CONTROL

Many times designated secured areas require authorized entrance control. This is commonly accomplished utilizing special coding devices, i.e., cards, pushbuttons, etc., which activate the locking mechanism.

Defect:	UOM	LEVEL II KEY	LEVEL III KEY
<p><b>* Physical Damage:</b> (caused by impact damage, use, and environmental location)</p> <p>Observation:</p>			
a. Loose, worn, or misaligned parts. Requires tightening or adjusting. *** {Severity L}	EA		
b. Broken or missing parts. (Unit still functions). *** {Severity M}	EA		
c. Broken or missing parts. (Unit not functioning). *** {Severity H}	EA		4
<p><b>Defect:</b></p> <p><b>* Access Control Working Improperly:</b> Observation:</p>			
a. Access control working improperly (Intermittent failures, improper access, etc.) *** {Severity H}	EA		4

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## 11.02 BUILDING SECURITY SYSTEMS

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### COMPONENTS (Continued)

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#### ◆ 11.02.05 SECURITY - WINDOW/GLASS SENSORS

A window sensor is a set of magnetic contacts that completes an electrical circuit as long as the window is in a secured position. When the contacts are separated the electrical circuit is broken, which sends a signal to the controller/processor, which will activate the alarm device. The glass is also protected by electric circuitry, that when the glass is broken it sends a similar signal back to the controller.

Defect:	UOM	LEVEL II KEY	LEVEL III KEY
<p><b>* Physical Damage:</b> (caused by impact damage, use, and environmental location)</p> <p>Observation:</p>			
a. Loose, worn, or misaligned parts. Requires tightening or adjusting. *** {Severity L}	EA		
b. Broken or missing parts. (Sensor still functions). *** {Severity M}	EA		
c. Broken or missing parts. (Sensor not functioning). *** {Severity H}	EA		5
<p><b>Defect:</b></p> <p><b>* Window/Glass Sensor Working Improperly:</b> Observation:</p>			
a. Sensor working improperly (false signal, intermittent failure, etc.) *** {Severity H}	EA		5

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## 11.02 BUILDING SECURITY SYSTEMS

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### COMPONENTS (Continued)

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#### ◆ 11.02.06 SECURITY - INTERIOR MOTION SENSORS

Interior secured areas can be monitored by motion sensors. The sensors are commonly activated by motion or heat. The sensors recognize the stimulus and send a signal to the controller/processor which activates the alarm device.

Defect:	UOM	LEVEL II KEY	LEVEL III KEY
* <b>Physical Damage:</b> (caused by impact damage, use, and environmental location)			
Observation:			
a. Loose, worn, or misaligned parts. Requires tightening or adjusting. *** {Severity L}	EA		
b. Broken or missing parts. (Sensor still functions). *** {Severity M}	EA		
c. Broken or missing parts. (Sensor not functioning). *** {Severity H}	EA		6
<b>Defect:</b>			
* <b>Motion Sensor Working Improperly:</b>			
Observation:			
a. Sensor working improperly, gives false signals, intermittent failure. *** {Severity H}	EA		6

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## 11.02 BUILDING SECURITY SYSTEMS

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### COMPONENTS (Continued)

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#### ◆ 11.02.07 SECURITY - EXTERIOR MOTION SENSORS

Exterior secured areas can be monitored by motion sensors. The sensors are commonly activated by motion or heat. The sensors recognize the stimulus and send a signal to the controller/processor which activates the alarm device.

Defect:	UOM	LEVEL II KEY	LEVEL III KEY
* <b>Physical Damage:</b> (caused by impact damage, use, and environmental location)			
Observation:			
a. Loose, worn, or misaligned parts. Requires tightening or adjusting.	EA		
*** {Severity L}			
b. Broken or missing parts. (Sensor still functions).	EA		
*** {Severity M}			
c. Broken or missing parts. (Sensor not functioning).	EA		7
*** {Severity H}			
Defect:			
* <b>Motion Sensor Working Improperly:</b>			
Observation:			
a. Sensor working improperly. Gives false signals, intermittent failures, etc.	EA		7
*** {Severity H}			

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## 11.02 BUILDING SECURITY SYSTEMS

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### COMPONENTS (Continued)

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#### ◆ 11.02.08 SECURITY - ALARM DEVICES

Alarm devices are commonly visual or audible and are located and utilized to react to the specific needs of the secured area. These alarm devices are activated by a signal from the controller/processor which received its signal from a specific sensor.

Defect:	UOM	LEVEL II KEY	LEVEL III KEY
* <b>Physical Damage:</b>			
(caused by impact damage, use, and environmental location)			
Observation:			
a. Loose, worn, or misaligned parts. Requires tightening or adjusting.	EA		
*** {Severity L}			
b. Broken or missing parts. (Alarm still functions).	EA		
*** {Severity M}			
c. Broken or missing parts. (Alarm not functioning).	EA		8
*** {Severity H}			
<b>Defect:</b>			
* <b>Alarm Device Working Improperly:</b>			
Observation:			
a. Alarm working improperly. False alarms, intermittent failure, etc.	EA		8
*** {Severity H}			

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## 11.02 BUILDING SECURITY SYSTEMS

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### REFERENCES

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1. Security, Closed Circuit Video, Access Control Systems, Simplex Building Systems, Inc. 1991
2. National Fire Protection Association (NFPA) Standards, 72-90 Installation, Maintenance, and Use of Protective Signaling Systems.
3. Joint Service Interior Intrusion Detection System (J-SIIDS) Technical Manual (TM) 5-6350-262-14
4. Army Technical Bulletin (TB) 53-6350-262
5. Technical Manual NAVELEX 0967-466-9000 series
6. National Electrical Manufacturer's Association Publication MRI-1953 (with amendments)

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**11.02 BUILDING SECURITY SYSTEMS**

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**LEVEL II KEY                      GUIDE SHEET CONTROL NUMBER**

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N/A

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**LEVEL III KEY                      GUIDE SHEET CONTROL NUMBER**

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1	GS-III 11.02.01-1
2	GS-III 11.02.02-2
3	GS-III 11.02.03-3
4	GS-III 11.02.04-4
5	GS-III 11.02.05-5
6	GS-III 11.02.06-6
7	GS-III 11.02.07-7
8	GS-III 11.02.08-8

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**LEVEL III INSPECTION METHOD GUIDE SHEET**

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**LEVEL III GUIDE SHEET - KEY NO. 1**

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**COMPONENT:** BUILDING SECURITY SYSTEM - CONTROLLER/PROCESSOR  
**CONTROL NUMBER:** GS-III 11.02.01-1

**Application**

This guide applies to investigation of improper operation of the building security system controller/processor. Improper operation of the controller/processor may be due to impact damage, wear and/or use and electrical deficiencies.

**Special Safety Requirements**

Inspections of security systems may present hazards in examining system electrical components. Caution should be used in inspecting and operating this special electrical device. Additional general safety requirements for the performance of the Level III inspection are contained in the Master Safety Plan and System Safety Section.

**Inspection Action**

Level III inspection requires the expertise of an individual that is trained in the inspection and operation of the security system and electrical control components to further assess the extent of the component defect.

1. Review facility data files (Operation & Maintenance Manuals) to determine manufacture and technical specification related to the controller/processor.
2. Analyze inspection data from Level I inspection, in conjunction with Operation & Maintenance Manuals, to determine whether further inspection should be performed, and if so, by in-house technical capabilities or manufacture's representative.
3. Order inspection to be completed to determine extent and cost associated with correcting the deficiency.

**Special Tools and Equipment Requirements**

Electrical Testing Equipment as required.

**Recommended Inspection Frequency**

There is no standard frequency prescribed for this component. The Level III inspection is activated by deficiencies observed during the Level I and/or Level II inspections.

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**LEVEL III INSPECTION METHOD GUIDE SHEET**

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**LEVEL III GUIDE SHEET - KEY NO. 1 (Continued)**

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**COMPONENT:** BUILDING SECURITY SYSTEM - CONTROLLER/PROCESSOR  
**CONTROL NUMBER:** GS-III 11.02.01-1

**References**

1. Security, Closed Circuit Video, Access Control Systems, Simplex Building Systems, Inc. 1991
2. National Fire Protection Association (NFPA) Standards, 72-90 Installation, Maintenance, and Use of Protective Signaling Systems.
3. Joint Service Interior Intrusion Detection System (J-SIIDS) Technical Manual (TM) 5-6350-262-14
4. Army Technical Bulletin (TB) 53-6350-262
5. Technical Manual NAVELEX 0967-466-9000 series
6. National Electrical Manufacturer's Association Publication MRI-1953 (with amendments)

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**LEVEL III INSPECTION METHOD GUIDE SHEET**

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**LEVEL III GUIDE SHEET - KEY NO. 2**

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**COMPONENT:** BUILDING SECURITY SYSTEM - TV MONITORS/CAMERAS  
**CONTROL NUMBER:** GS-III 11.02.02-2

**Application**

This guide applies to investigation of improper operation of the building security system TV monitors/cameras. Improper operation of the TV monitors/cameras may be due to impact damage, wear and/or use and electrical deficiencies.

**Special Safety Requirements**

Inspections of security systems may present hazards in examining system electrical components. Caution should be used in inspecting and operating this special electrical device. Additional general safety requirements for the performance of the Level III inspection are contained in the Master Safety Plan and System Safety Section.

**Inspection Action**

Level III inspection requires the expertise of an individual that is trained in the inspection and operation of the security system and electrical control components to further assess the extent of the component defect.

1. Review facility data files (Operation & Maintenance Manuals) to determine manufacture and technical specification related to the TV monitors/cameras.
2. Analyze inspection data from Level I inspection, in conjunction with Operation & Maintenance Manuals, to determine whether further inspection should be performed, and if so, by in-house technical capabilities or manufacture's representative.
3. Order inspection to be completed to determine extent and cost associated with correcting the deficiency.

**Special Tools and Equipment Requirements**

Electrical Testing Equipment as required.

**Recommended Inspection Frequency**

There is no standard frequency prescribed for this component. The Level III inspection is activated by deficiencies observed during the Level I and/or Level II inspections.

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**LEVEL III INSPECTION METHOD GUIDE SHEET**

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**LEVEL III GUIDE SHEET - KEY NO. 2 (Continued)**

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**COMPONENT:** BUILDING SECURITY SYSTEM - TV MONITORS/CAMERAS  
**CONTROL NUMBER:** GS-III 11.02.02-2

**References**

1. Security, Closed Circuit Video, Access Control Systems, Simplex Building Systems, Inc. 1991
2. National Fire Protection Association (NFPA) Standards, 72-90 Installation, Maintenance, and Use of Protective Signaling Systems.
3. Joint Service Interior Intrusion Detection System (J-SIIDS) Technical Manual (TM) 5-6350-262-14
4. Army Technical Bulletin (TB) 53-6350-262
5. Technical Manual NAVELEX 0967-466-9000 series
6. National Electrical Manufacturer's Association Publication MRI-1953 (with amendments)

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**LEVEL III INSPECTION METHOD GUIDE SHEET**

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**LEVEL III GUIDE SHEET - KEY NO. 3**

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**COMPONENT:** BUILDING SECURITY SYSTEM - DOOR SENSORS  
**CONTROL NUMBER:** GS-III 11.02.03-3

**Application**

This guide applies to investigation of improper operation of the building security system sensors. Improper operation of the security system may be due to impact damage, wear and/or use and electrical deficiencies.

**Special Safety Requirements**

Inspections of security systems may present hazards in examining system electrical components. Caution should be used in inspecting and operating this special electrical device. Additional general safety requirements for the performance of the Level III inspection are contained in the Master Safety Plan and System Safety Section.

**Inspection Action**

Level III inspection requires the expertise of an individual that is trained in the inspection and operation of the security system and electrical control components to further assess the extent of the component defect.

1. Review facility data files (Operation & Maintenance Manuals) to determine manufacture and technical specification related to the sensors.
2. Analyze inspection data from Level I inspection, in conjunction with Operation & Maintenance Manuals, to determine whether further inspection should be performed, and if so, by in-house technical capabilities or manufacture's representative.
3. Order inspection to be completed to determine extent and cost associated with correcting the deficiency.

**Special Tools and Equipment Requirements**

Electrical Testing Equipment as required.

**Recommended Inspection Frequency**

There is no standard frequency prescribed for this component. The Level III inspection is activated by deficiencies observed during the Level I and/or Level II inspections.

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**LEVEL III INSPECTION METHOD GUIDE SHEET**

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**LEVEL III GUIDE SHEET - KEY NO. 3 (Continued)**

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**COMPONENT:** BUILDING SECURITY SYSTEM - DOOR SENSORS .  
**CONTROL NUMBER:** GS-III 11.02.03-3

**References**

1. Security, Closed Circuit Video, Access Control Systems, Simplex Building Systems, Inc. 1991
2. National Fire Protection Association (NFPA) Standards, 72-90 Installation, Maintenance, and Use of Protective Signaling Systems.
3. Joint Service Interior Intrusion Detection System (J-SIIDS) Technical Manual (TM) 5-6350-262-14
4. Army Technical Bulletin (TB) 53-6350-262
5. Technical Manual NAVELEX 0967-466-9000 series
6. National Electrical Manufacturer's Association Publication MRI-1953 (with amendments)

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**LEVEL III INSPECTION METHOD GUIDE SHEET**

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**LEVEL III GUIDE SHEET - KEY NO. 4**

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**COMPONENT:** BUILDING SECURITY SYSTEM - ENTRY ACCESS CONTROLS  
**CONTROL NUMBER:** GS-III 11.02.04-4

**Application**

This guide applies to investigation of improper operation of the building security system entry access controls. Improper operation of the entry access controls may be due to impact damage, wear and/or use and electrical deficiencies.

**Special Safety Requirements**

Inspections of security systems may present hazards in examining system electrical components. Caution should be used in inspecting and operating this special electrical device. Additional general safety requirements for the performance of the Level III inspection are contained in the Master Safety Plan and System Safety Section.

**Inspection Action**

Level III inspection requires the expertise of an individual that is trained in the inspection and operation of the security system and electrical control components to further assess the extent of the component defect.

1. Review facility data files (Operation & Maintenance Manuals) to determine manufacture and technical specification related to the entry access control.
2. Analyze inspection data from Level I inspection, in conjunction with Operation & Maintenance Manuals, to determine whether further inspection should be performed, and if so, by in-house technical capabilities or manufacture's representative.
3. Order inspection to be completed to determine extent and cost associated with correcting the deficiency.

**Special Tools and Equipment Requirements**

Electrical Testing Equipment as required.

**Recommended Inspection Frequency**

There is no standard frequency prescribed for this component. The Level III inspection is activated by deficiencies observed during the Level I and/or Level II inspections.

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**LEVEL III INSPECTION METHOD GUIDE SHEET**

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**LEVEL III GUIDE SHEET - KEY NO. 4 (Continued)**

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**COMPONENT:** BUILDING SECURITY SYSTEM - ENTRY ACCESS CONTROLS  
**CONTROL NUMBER:** GS-III 11.02.04-4

**References**

1. Security, Closed Circuit Video, Access Control Systems, Simplex Building Systems, Inc. 1991
2. National Fire Protection Association (NFPA) Standards, 72-90 Installation, Maintenance, and Use of Protective Signaling Systems.
3. Joint Service Interior Intrusion Detection System (J-SIIDS) Technical Manual (TM) 5-6350-262-14
4. Army Technical Bulletin (TB) 53-6350-262
5. Technical Manual NAVELEX 0967-466-9000 series
6. National Electrical Manufacturer's Association Publication MRI-1953 (with amendments)

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**LEVEL III INSPECTION METHOD GUIDE SHEET**

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**LEVEL III GUIDE SHEET - KEY NO. 5**

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**COMPONENT:** BUILDING SECURITY SYSTEM - WINDOW GLASS SENSORS  
**CONTROL NUMBER:** GS-III 11.02.05-5

**Application**

This guide applies to investigation of improper operation of the building security system sensors. Improper operation of the security system may be due to impact damage, wear and/or use and electrical deficiencies.

**Special Safety Requirements**

Inspections of security systems may present hazards in examining system electrical components. Caution should be used in inspecting and operating this special electrical device. Additional general safety requirements for the performance of the Level III inspection are contained in the Master Safety Plan and System Safety Section.

**Inspection Action**

Level III inspection requires the expertise of an individual that is trained in the inspection and operation of the security system and electrical control components to further assess the extent of the component defect.

1. Review facility data files (Operation & Maintenance Manuals) to determine manufacture and technical specification related to the sensors.
2. Analyze inspection data from Level I inspection, in conjunction with Operation & Maintenance Manuals, to determine whether further inspection should be performed, and if so, by in-house technical capabilities or manufacture's representative.
3. Order inspection to be completed to determine extent and cost associated with correcting the deficiency.

**Special Tools and Equipment Requirements**

Electrical Testing Equipment as required.

**Recommended Inspection Frequency**

There is no standard frequency prescribed for this component. The Level III inspection is activated by deficiencies observed during the Level I and/or Level II inspections.

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**LEVEL III INSPECTION METHOD GUIDE SHEET**

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**LEVEL III GUIDE SHEET - KEY NO. 5 (Continued)**

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**COMPONENT:** BUILDING SECURITY SYSTEM - WINDOW GLASS SENSORS  
**CONTROL NUMBER:** GS-III 11.02.05-5

**References**

1. Security, Closed Circuit Video, Access Control Systems, Simplex Building Systems, Inc. 1991
2. National Fire Protection Association (NFPA) Standards, 72-90 Installation, Maintenance, and Use of Protective Signaling Systems.
3. Joint Service Interior Intrusion Detection System (J-SIIDS) Technical Manual (TM) 5-6350-262-14
4. Army Technical Bulletin (TB) 53-6350-262
5. Technical Manual NAVELEX 0967-466-9000 series
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**LEVEL III INSPECTION METHOD GUIDE SHEET**

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**LEVEL III GUIDE SHEET - KEY NO. 6**

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**COMPONENT:** BUILDING SECURITY SYSTEM - INTERIOR MOTION SENSORS  
**CONTROL NUMBER:** GS-III 11.02.06-6

**Application**

This guide applies to investigation of improper operation of the building security system sensors. Improper operation of the security system may be due to impact damage, wear and/or use and electrical deficiencies.

**Special Safety Requirements**

Inspections of security systems may present hazards in examining system electrical components. Caution should be used in inspecting and operating this special electrical device. Additional general safety requirements for the performance of the Level III inspection are contained in the Master Safety Plan and System Safety Section.

**Inspection Action**

Level III inspection requires the expertise of an individual that is trained in the inspection and operation of the security system and electrical control components to further assess the extent of the component defect.

1. Review facility data files (Operation & Maintenance Manuals) to determine manufacture and technical specification related to the sensors.
2. Analyze inspection data from Level I inspection, in conjunction with Operation & Maintenance Manuals, to determine whether further inspection should be performed, and if so, by in-house technical capabilities or manufacture's representative.
3. Order inspection to be completed to determine extent and cost associated with correcting the deficiency.

**Special Tools and Equipment Requirements**

Electrical Testing Equipment as required.

**Recommended Inspection Frequency**

There is no standard frequency prescribed for this component. The Level III inspection is activated by deficiencies observed during the Level I and/or Level II inspections.

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**LEVEL III INSPECTION METHOD GUIDE SHEET**

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**LEVEL III GUIDE SHEET - KEY NO. 6 (Continued)**

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**COMPONENT:** BUILDING SECURITY SYSTEM - INTERIOR MOTION SENSORS  
**CONTROL NUMBER:** GS-III 11.02.06-6

**References**

1. Security, Closed Circuit Video, Access Control Systems, Simplex Building Systems, Inc. 1991
2. National Fire Protection Association (NFPA) Standards, 72-90 Installation, Maintenance, and Use of Protective Signaling Systems.
3. Joint Service Interior Intrusion Detection System (J-SIIDS) Technical Manual (TM) 5-6350-262-14
4. Army Technical Bulletin (TB) 53-6350-262
5. Technical Manual NAVELEX 0967-466-9000 series
6. National Electrical Manufacturer's Association Publication MRI-1953 (with amendments)

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**LEVEL III INSPECTION METHOD GUIDE SHEET**

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**LEVEL III GUIDE SHEET - KEY NO. 7**

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**COMPONENT:** BUILDING SECURITY SYSTEM - EXTERIOR MOTION SENSORS  
**CONTROL NUMBER:** GS-III 11.02.07-7

**Application**

This guide applies to investigation of improper operation of the building security system sensors. Improper operation of the security system may be due to impact damage, wear and/or use and electrical deficiencies.

**Special Safety Requirements**

Inspections of security systems may present hazards in examining system electrical components. Caution should be used in inspecting and operating this special electrical device. Additional general safety requirements for the performance of the Level III inspection are contained in the Master Safety Plan and System Safety Section.

**Inspection Action**

Level III inspection requires the expertise of an individual that is trained in the inspection and operation of the security system and electrical control components to further assess the extent of the component defect.

1. Review facility data files (Operation & Maintenance Manuals) to determine manufacture and technical specification related to the sensors.
2. Analyze inspection data from Level I inspection, in conjunction with Operation & Maintenance Manuals, to determine whether further inspection should be performed, and if so, by in-house technical capabilities or manufacture's representative.
3. Order inspection to be completed to determine extent and cost associated with correcting the deficiency.

**Special Tools and Equipment Requirements**

Electrical Testing Equipment as required.

**Recommended Inspection Frequency**

There is no standard frequency prescribed for this component. The Level III inspection is activated by deficiencies observed during the Level I and/or Level II inspections.

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**LEVEL III INSPECTION METHOD GUIDE SHEET**

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**LEVEL III GUIDE SHEET - KEY NO. 7 (Continued)**

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**COMPONENT:** BUILDING SECURITY SYSTEM - EXTERIOR MOTION SENSORS  
**CONTROL NUMBER:** GS-III 11.02.07-7

**References**

1. Security, Closed Circuit Video, Access Control Systems, Simplex Building Systems, Inc. 1991
2. National Fire Protection Association (NFPA) Standards, 72-90 Installation, Maintenance, and Use of Protective Signaling Systems.
3. Joint Service Interior Intrusion Detection System (J-SIIDS) Technical Manual (TM) 5-6350-262-14
4. Army Technical Bulletin (TB) 53-6350-262
5. Technical Manual NAVELEX 0967-466-9000 series
6. National Electrical Manufacturer's Association Publication MRI-1953 (with amendments)

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**LEVEL III INSPECTION METHOD GUIDE SHEET**

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**LEVEL III GUIDE SHEET - KEY NO. 8**

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**COMPONENT:** BUILDING SECURITY SYSTEM - ALARM DEVICES  
**CONTROL NUMBER:** GS-III 11.02.08-8

**Application**

This guide applies to investigation of improper operation of the building security system alarm devices. Improper operation of the alarm devices may be due to impact damage, wear and/or use and electrical deficiencies.

**Special Safety Requirements**

Inspections of security systems may present hazards in examining system electrical components. Caution should be used in inspecting and operating this special electrical device. Additional general safety requirements for the performance of the Level III inspection are contained in the Master Safety Plan and System Safety Section.

**Inspection Action**

Level III inspection requires the expertise of an individual that is trained in the inspection and operation of the security system and electrical control components to further assess the extent of the component defect.

1. Review facility data files (Operation & Maintenance Manuals) to determine manufacture and technical specification related to the alarm devices.
2. Analyze inspection data from Level I inspection, in conjunction with Operation & Maintenance Manuals, to determine whether further inspection should be performed, and if so, by in-house technical capabilities or manufacture's representative.
3. Order inspection to be completed to determine extent and cost associated with correcting the deficiency.

**Special Tools and Equipment Requirements**

Electrical Testing Equipment as required.

**Recommended Inspection Frequency**

There is no standard frequency prescribed for this component. The Level III inspection is activated by deficiencies observed during the Level I and/or Level II inspections.

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**LEVEL III INSPECTION METHOD GUIDE SHEET**

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**LEVEL III GUIDE SHEET - KEY NO. 8 (Continued)**

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**COMPONENT:** BUILDING SECURITY SYSTEM - ALARM DEVICES  
**CONTROL NUMBER:** GS-III 11.02.08-8

**References**

1. Security, Closed Circuit Video, Access Control Systems, Simplex Building Systems, Inc. 1991
2. National Fire Protection Association (NFPA) Standards, 72-90 Installation, Maintenance, and Use of Protective Signaling Systems.
3. Joint Service Interior Intrusion Detection System (J-SIIDS) Technical Manual (TM) 5-6350-262-14
4. Army Technical Bulletin (TB) 53-6350-262
5. Technical Manual NAVELEX 0967-466-9000 series
6. National Electrical Manufacturer's Association Publication MRI-1953 (with amendments)

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## 11.03 BUILDING COMMUNICATION SYSTEMS

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### DESCRIPTION

The Building Communication System is a network of equipment consisting of one or more of the following units: annunciator/transmitter unit, and remote equipment (intercoms, phones, speakers). The network of equipment is commonly connected by cable to the annunciator/transmitter unit.

### SPECIAL TOOL AND EQUIPMENT REQUIREMENTS

No special tools are needed for the inspection of the Building Communication System, beyond the requirements listed in the Building Other Electrical Standard Tools Section.

### SPECIAL SAFETY REQUIREMENTS

No special safety requirements are needed for the inspection of the Building Communication System, beyond the requirements listed in the Master Safety Plan and System Safety Section.

### COMPONENT LIST

- ◆ 11.03.01 COMMUNICATION - ANNUNCIATOR/TRANSMITTER
- ◆ 11.03.02 COMMUNICATION - REMOTE UNITS

### RELATED SUBSYSTEMS

Due to the related nature of the elements requiring inspection, the following DS/IM's should be reviewed for concurrent inspection activities.

10.00 BUILDING ELECTRICAL (all subsystems)

### STANDARD INSPECTION PROCEDURE

The standard inspection procedure for this subsystem is a visual inspection of each Building Communication System, augmented by a Level II Inspection when required. Very few Level II or III inspection keys are indicated for the Building Communication System subsystem. Some inspections may require the inspector to utilize a ladder or similar device to observe defect/observations above the inspectors normal line of sight. The inspection should be carried out in order of presentation of the various components. Associated defects and observations are listed which will be presented in the inspector's Data Collection Device (DCD).

The Inspection Unit (IU) is defined at the subsystem level. Each discrete communications system should be identified as a separate IU. (e.g. A Public Address system should be classified as a separate IU from a intercom system when both occur within the same building).

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## 11.03 BUILDING COMMUNICATION SYSTEMS

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### COMPONENTS

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#### ◆ 11.03.01 COMMUNICATION - ANNUNCIATOR/TRANSMITTER

The annunciator/transmitter unit is a communication device used to transmit and/or receive audible or visual signals from other devices connected to the communication network.

Defect:	UOM	LEVEL II KEY	LEVEL III KEY
* <b>Physical Damage:</b> (caused by impact damage, use, and environmental location) Observation:			
a. Loose, worn, or misaligned parts. Requires tightening or adjusting. *** {Severity L}	EA		
b. Broken or missing parts. (Unit still functions). *** {Severity M}	EA		
c. Broken or missing parts. (Unit not functioning). *** {Severity H}	EA		1

#### Defect:

* <b>Annunciator/Transmitter Working Improperly:</b> Observation:			
a. Annunciator/Transmitter working improperly, intermittent transmission failure, excessive static, etc. *** {Severity H}	EA		1

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## 11.03 BUILDING COMMUNICATION SYSTEMS

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### COMPONENTS (Continued)

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#### ◆ 11.03.02 COMMUNICATION - REMOTE UNITS

Remote units consist of intercoms, speakers, and phones. These units are commonly controlled from the annunciator/transmitter base unit, but may also be connected through a wiring network to operate independently with other remote units for direct communication.

Defect:	UOM	LEVEL II KEY	LEVEL III KEY
* <b>Physical Damage:</b> (caused by impact damage, use, and environmental location) Observation:			
a. Loose, worn, or misaligned parts. Requires tightening or adjusting. *** {Severity L}	EA		
b. Broken or missing parts. (Remote unit still functions). *** {Severity M}	EA		
c. Broken or missing parts. (Remote unit not functioning). *** {Severity H}	EA		2
* <b>Remote Unit Working Improperly:</b> Observation:			
a. Remote unit malfunctioning. (Intermittent transmission failure, excessive static, etc). *** {Severity H}	EA		2

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## 11.03 BUILDING COMMUNICATION SYSTEMS

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### REFERENCES

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1. Security, Closed Circuit Video, Access Control Systems, Simplex Building Systems, Inc. 1991
2. National Electrical Manufacturer's Association Publication MRI-1953 (with amendments)

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### 11.03 BUILDING COMMUNICATION SYSTEMS

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**LEVEL II KEY                      GUIDE SHEET CONTROL NUMBER**

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N/A

**LEVEL III KEY                      GUIDE SHEET CONTROL NUMBER**

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1	GS-III 11.03.01-1
2	GS-III 11.03.02-2

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**LEVEL III INSPECTION METHOD GUIDE SHEET**

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**LEVEL III GUIDE SHEET - KEY NO. 1**

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**COMPONENT:** BUILDING COMMUNICATION SYSTEM -  
ANNUNCIATOR/TRANSMITTER  
**CONTROL NUMBER:** GS-III 11.03.01-1

**Application**

This guide applies to investigation of improper operation of the building communication system annunciator or transmitter. Improper operation of either the annunciator or transmitter may be due to impact damage, wear and/or use and electrical deficiencies.

**Special Safety Requirements**

Inspections of communication systems may present hazards in examining system electrical components. Caution should be used in inspecting and operating this special electrical device. Additional general safety requirements for the performance of the Level III inspection are contained in the Master Safety Plan and System Safety Section.

**Inspection Action**

Level III inspection requires the expertise of an individual that is trained in the inspection and operation of the communication system and electrical control components to further assess the extent of the component defect.

1. Review facility data files (Operation & Maintenance Manuals) to determine manufacture and technical specification related to the annunciator/transmitter.
2. Analyze inspection data from Level I inspection, in conjunction with Operation & Maintenance Manuals, to determine whether further inspection should be performed, and if so, by in-house technical capabilities or manufacture's representative.
3. Order inspection to be completed to determine extent and cost associated with correcting the deficiency.

**Special Tools and Equipment Requirements**

Electrical Testing Equipment as required.

**Recommended Inspection Frequency**

There is no standard frequency prescribed for this component. The Level III inspection is activated by deficiencies observed during the Level I and/or Level II inspections.

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**LEVEL III INSPECTION METHOD GUIDE SHEET**

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**LEVEL III GUIDE SHEET - KEY NO. 1 (Continued)**

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**COMPONENT:** BUILDING COMMUNICATION SYSTEM -  
ANNUNCIATOR/TRANSMITTER  
**CONTROL NUMBER:** GS-III 11.03.01-1

**References**

1. Security, Closed Circuit Video, Access Control Systems, Simplex Building Systems, Inc. 1991
2. National Electrical Manufacturer's Association Publication MRI-1953 (with amendments)
3. AT&T Communications and Sounds
4. NEC 800 Communications Circuit
5. UL 813 Commercial Audio Equipment
6. UL 1459 Telephone Equipment
7. UL 1711 Amplifier for Fire Protective Signalling Systems
8. FCC, Part 15 Emissions
9. FCC, Part 68 Connection of Terminal Equipment to Telephone Network

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**LEVEL III INSPECTION METHOD GUIDE SHEET**

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**LEVEL III GUIDE SHEET - KEY NO. 2**

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**COMPONENT:** BUILDING COMMUNICATION SYSTEM - REMOTE UNITS  
**CONTROL NUMBER:** GS-III 11.03.02-2

**Application**

This guide applies to investigation of improper operation of the building communication system remote units. Improper operation of the remote units may be due to impact damage, wear and/or use and electrical deficiencies.

**Special Safety Requirements**

Inspections of communication systems may present hazards in examining system electrical components. Caution should be used in inspecting and operating this special electrical device. Additional general safety requirements for the performance of the Level III inspection are contained in the Master Safety Plan and System Safety Section.

**Inspection Action**

Level III inspection requires the expertise of an individual that is trained in the inspection and operation of the communication system and electrical control components to further assess the extent of the component defect.

1. Review facility data files (Operation & Maintenance Manuals) to determine manufacture and technical specification related to the remote units.
2. Analyze inspection data from Level I inspection, in conjunction with Operation & Maintenance Manuals, to determine whether further inspection should be performed, and if so, by in-house technical capabilities or manufacture's representative.
3. Order inspection to be completed to determine extent and cost associated with correcting the deficiency.

**Special Tools and Equipment Requirements**

Electrical Testing Equipment as required.

**Recommended Inspection Frequency**

There is no standard frequency prescribed for this component. The Level III inspection is activated by deficiencies observed during the Level I and/or Level II inspections.

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**LEVEL III INSPECTION METHOD GUIDE SHEET**

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**LEVEL III GUIDE SHEET - KEY NO. 2 (Continued)**

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**COMPONENT:** BUILDING COMMUNICATION SYSTEM - REMOTE UNITS  
**CONTROL NUMBER:** GS-III 11.03.02-2

**References**

1. Security, Closed Circuit Video, Access Control Systems, Simplex Building Systems, Inc. 1991
2. National Electrical Manufacturer's Association Publication MRI-1953 (with amendments)
3. AT&T Communications and Sounds
4. NEC 800 Communications Circuit
5. UL 813 Commercial Audio Equipment
6. UL 1459 Telephone Equipment
7. UL 1711 Amplifier for Fire Protective Signalling Systems
8. FCC, Part 15 Emissions
9. FCC, Part 68 Connection of Terminal Equipment to Telephone Network

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**APPENDIX A**

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**ABBREVIATIONS**

BLDG	Building
BLDG SUPER	Building Supervisor
CAIS	Condition Assessment Information System
CAS	Condition Assessment Survey
CCU	Central Control Unit
CF	Cubic Feet
CMU	Concrete Masonry Unit
CONSTR	Construction
CRT	Computer Remote Terminal
CU. FT.	Cubic Feet
CU. IN.	Cubic Inches
DCD	Data Collection Device
DOD	Department of Defense
DS/IM	Deficiency Standard/Inspection Method
EA	Each
ELEC	Electric, Electrical
EMCS	Energy Management Control System
ENCL	Enclosure
EST	Estimate
EXT	Exterior
FM	Facility Manager
FT	Foot, Feet
HT	Height
HVAC	Heating, Ventilating, and Air Conditioning

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**APPENDIX A**

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IN	Inch
INSUL	Insulation
INT	Interior
IU	Inspection Unit
LF	Linear Foot
LGTH	Length
MAT'L	Material
MECH	Mechanical
MFG	Manufacturer
MISC	Miscellaneous
PREFAB	Prefabricated
RM	Room
RPI	Real Property Inventory
SF	Square Foot
STD	Standard
SY	Square Yard
TYP	Typical
UOM	Unit Of Measure
WBS	Work Breakdown Structure
W/	With
'	Foot, Feet
"	Inch, Inches
>	Greater than
<	Less Than

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**APPENDIX B**

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**GLOSSARY**

<b>Annunciator/ Transmitter</b>	A communication device that transmits or receives audible or visual signals to accomplish the required communication within a building.
<b>Central Control Unit</b>	A computerized building management system which receives signals from the sensors and uses a programmed logic to determine operating changes that need to be made within a building.
<b>Computer Remote Terminal</b>	A visual monitor and keyboard that allows the operator to view the data from the central control unit, and make any adjustments to the data, which in turn adjusts the central control unit.
<b>Controller/Processor</b>	An electrical device which receives signals from remote sensors and actuates required signals to remote control devices.
<b>Sensors</b>	Devices which commonly sense temperature, humidity, electrical demand, smoke, air pressure, air flow, light levels, etc. Sensors send a signal to the central control unit through an electrical network for analyses.

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**APPENDIX C**

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**LIFE CYCLES****11 BUILDING OTHER ELECTRICAL SYSTEMS****11.01 ENERGY MANAGEMENT CONTROL SYSTEM**

11.01.01	EMCS - SENSORS	20 YRS
11.01.02	EMCS - COMPUTER REMOTE TERMINAL	20 YRS
11.01.03	EMCS - CENTRAL CONTROL UNIT	20 YRS

## Source:

Energy Management and Controls, Johnson Controls Inc. 1990

**11.02 BUILDING SECURITY SYSTEMS**

11.02.01	SECURITY - CONTROLLER/PROCESSOR	20 YRS
11.02.02	SECURITY - TV MONITORS/CAMERAS	20 YRS
11.02.03	SECURITY - DOOR SENSORS	20 YRS
11.02.04	SECURITY - DOORS ENTRY ACCESS CONTROL	20 YRS
11.02.05	SECURITY - WINDOW/GLASS SENSORS	20 YRS
11.02.06	SECURITY - INTERIOR MOTION SENSORS	20 YRS
11.02.07	SECURITY - EXTERIOR MOTION SENSORS	20 YRS
11.02.08	SECURITY - ALARM DEVICES	20 YRS

## Source:

Security, Closed Circuit Video, Access Control Systems, Simplex Building Systems, Inc. 1991

**11.03 BUILDING COMMUNICATION SYSTEMS**

11.03.01	COMMUNICATION - ANNUNCIATOR/ TRANSMITTER	20 YRS
11.03.02	COMMUNICATION - REMOTE UNITS	20 YRS

## Source:

Security, Closed Circuit Video, Access Control Systems, Simplex Building Systems, Inc. 1991