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QUALITY ASSURANCE/QUALITY CONTROL DOCUMENTATION SERIES	
TITLE	**PROCUREMENT AND ACCEPTANCE TESTING PROCEDURES FOR SCENE MONITORING EQUIPMENT**
TYPE	**STANDARD OPERATING PROCEDURE**
NUMBER	**4005**
DATE	**JANUARY 1994**

AUTHORIZATIONS		
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PROJECT MANAGER	James H. Wagner	
PROGRAM MANAGER	David L. Dietrich	
QA MANAGER	Gloria S. Mercer	
OTHER		

REVISION HISTORY			
REVISION NO.	CHANGE DESCRIPTION	DATE	AUTHORIZATIONS
0.1	Minor format and equipment changes.	February 1996	
1.0	Add SVHS video system references.	February 1999	

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1.0 PURPOSE AND APPLICABILITY

This standard operating procedure (SOP) describes the steps for procurement and acceptance testing of photographic and video equipment. This equipment is purchased for new installations or as replacement equipment at scene monitoring sites. Acceptance testing is performed to ensure that all systems are fully functional and operating within acceptable limits when shipped to designated sites.

Purchasing, fabrication, and acceptance testing of a full system or individual components of a system are addressed in:

- TI 4005-1000 *Procurement and Acceptance Testing Procedures for 35 mm Automatic Camera Systems*
- TI 4005-1001 *Procurement and Acceptance Testing Procedures for 8 mm Automatic Camera Systems*
- TI 4005-1050 *Procurement and Acceptance Testing of SVHS Time-Lapse Video Camera Systems for the Healy Clean Coal Project*

2.0 RESPONSIBILITIES

2.1 PROJECT MANAGER

The project manager shall:

- Quote camera specifications, prices, and delivery times to purchasing agents.
- Obtain information regarding specific equipment needed.
- Obtain site information, contact person's name, telephone number, shipping address, and any other special instructions needed to ship equipment to a site.
- Coordinate purchasing with the data coordinator.
- Coordinate acceptance testing with the data coordinator and field specialist.

2.2 DATA COORDINATOR

The data coordinator shall:

- Prepare equipment purchase orders as directed by the project manager and send the orders to appropriate vendors.
- Receive, label, log, and inventory all equipment.
- Maintain inventory information in the equipment database.
- Assemble photographic equipment and perform initial quality assurance checks.
- Ship camera and lenses to a local factory-authorized repair facility for a full system check.

- Load the photographic system with film (or SVHS videotape) and take test photographs (or film footage).

- Assemble the photographic system (camera, cables, timer, and batteries) and perform acceptance testing procedures.

- Assemble the 35mm or 8 mm camera enclosures (including fabricating and installing camera tripods and security plates).

- Verify tripod placement and security of windows and doors in the 35 mm or 8 mm camera enclosure.

- Assemble a site operator's manual and all necessary 35 mm or 8 mm photographic monitoring supplies.

- Package and ship the photographic systems according to specifications.

2.3 FIELD SPECIALIST

The field specialist shall:

- Assemble the video equipment (including camera, cables, monitor, and SVHS recorder) and perform acceptance testing procedures.

- Assemble the video enclosures (including heaters, fans, power systems, and any required power systems, camera mounts, and security plates) and perform acceptance testing procedures.

- Assemble a site operator's manual and all necessary time-lapse video monitoring supplies.

- Package and ship the video systems according to specifications.

2.4 COMMUNICATIONS TECHNICIAN

A trained and certified communications technician shall acceptance test any communications system used in connection with a photographic or video monitoring system. These communications systems may include a microwave transmitter/receiver system or other specialized communications system.

3.0 REQUIRED EQUIPMENT AND MATERIALS

3.1 REQUIRED EQUIPMENT AND MATERIALS FOR 35 MM OR 8 MM SYSTEMS

Equipment and materials required to test a 35 mm or 8 mm photographic system include:

- A camera.

- A lens (for 35 mm camera only).

- A winding system (for 35 mm camera only).

- A camera databack (for 35 mm camera only).
- A UV filter (for 35 mm camera only).
- Programmable timer and cables.
- Batteries.
- Film.
- A documentation chart.
- A *Visibility Network Photo Log* (35 mm camera only).
- A *Camera Test Form* (8 mm camera only).
- A tripod mount and mounting hardware.
- An environmentally-sealed and lockable enclosure.

Equipment and materials required to test a camera system at a local factory-authorized dealer also include a multi-plex camera tester.

3.2 REQUIRED EQUIPMENT AND MATERIALS FOR SVHS VIDEO SYSTEMS

Equipment and materials required to test an SVHS time-lapse video system include:

- A high-resolution color video camera with lens.
- A programmable SVHS video recorder.
- A color video monitor.
- Power and signal cables.
- A cross-polarizing lens filter.
- A camera enclosure.
- SVHS videotapes.
- A voltmeter.
- An *SVHS Time-Lapse Video System Test Log*.

4.0 METHODS

This section includes the following four (4) subsections:

4.1 Procurement
4.2 Acceptance Testing
4.3 Inventory
4.4 Shipping

4.1 PROCUREMENT

Purchase Orders (POs) for system components or fully integrated systems are generated by the data coordinator and sent to the project manager for approval. Upon approval, the POs are sent to the appropriate equipment vendors. Upon arrival at ARS, the equipment is cross-checked against the PO and readied for acceptance testing. Complete descriptions of procurement procedures are detailed in TI 4005-1000, *Procurement and Acceptance Testing Procedures for 35 mm Automatic Camera Systems*, TI 4005-1001, *Procurement and Acceptance Testing Procedures for 8 mm Automatic Camera Systems*, and TI 4005-1050, *Procurement and Acceptance Testing of SVHS Time-Lapse Video Camera Systems for the Healy Clean Coal Project*.

All photographic and video system components purchased from ARS Technologies, Inc. or other suppliers have undergone thorough manufacturer testing. All components are guaranteed.

4.2 ACCEPTANCE TESTING

Photographic or video equipment purchased from a manufacturer is subject to thorough inspection and acceptance testing upon receipt at ARS. These inspections include individual component and full system checks to verify that the equipment is operating within manufacturer's specifications.

ARS has a long, established relationship with local factory-authorized repair facilities. These facilities provide prompt, thorough photographic testing and preventive maintenance and repair services. Cameras that pass all tests are then tested as part of the integrated monitoring system.

Complete descriptions for ARS testing and factory-authorized dealer testing are detailed in TI 4005-1000, *Procurement and Acceptance Testing Procedures for 35 mm Automatic Camera Systems*, TI 4005-1001, *Procurement and Acceptance Testing Procedures for 8 mm Automatic Camera Systems*, and TI 4005-1050, *Procurement and Acceptance Testing of SVHS Time-Lapse Video Camera Systems for the Healy Clean Coal Project*.

4.3 INVENTORY

An up-to-date accounting of purchase and warranty information, location, and status of all purchased equipment is maintained. Primary accounting is performed on an equipment database developed by ARS. The database can be searched and sorted by fields to yield reports such as equipment listings by site, equipment type, manufacturer, model number, serial number, property number, purchase order number, date purchased, or a variety of additional search fields.

4.4 SHIPPING

Integrated photographic systems or individual components are packed for shipping following successful testing. All shipments will be made by the most expedient, cost-effective method. Packing slips containing item description, serial number, quantity, weight, and insurance value for all shipments accompany each shipping container. A record of the shipment including a copy of the packing slip is kept on file by the data coordinator.

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QUALITY ASSURANCE/QUALITY CONTROL DOCUMENTATION SERIES	
TITLE	**PROCUREMENT AND ACCEPTANCE TESTING PROCEDURES FOR 35 MM AUTOMATIC CAMERA SYSTEMS**
TYPE	**TECHNICAL INSTRUCTION**
NUMBER	**4005-1000**
DATE	**NOVEMBER 1993**

AUTHORIZATIONS		
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QA MANAGER	Gloria S. Mercer	
OTHER		

REVISION HISTORY			
REVISION NO.	CHANGE DESCRIPTION	DATE	AUTHORIZATIONS
0.1	Minor format and equipment changes.	February 1996	

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1.0 PURPOSE AND APPLICABILITY

This technical instruction (TI) describes the steps for procurement and acceptance testing of 35 mm photographic equipment. The primary purpose of acceptance testing is to ensure that all systems are fully functional and operating within acceptable limits when shipped to designated sites.

For the purpose of this TI, a full automatic 35 mm camera system consists of the following components:

- 35 mm camera with winder and databack
- Lens with UV filter
- Programmable timer and cabling
- Environmental enclosure with sunshield and internal locks
- Quick-release camera mount
- Documentation chart
- Instruction manuals and example forms
- Lens cleaning supplies
- Batteries
- Mounting post

2.0 RESPONSIBILITIES

2.1 PROJECT MANAGER

The project manager shall:

- Quote camera specifications, prices, and delivery times to purchasing agents.
- Obtain information regarding specific equipment needed.
- Obtain site information, contact person's name, telephone number, shipping address, and any other special instructions needed to ship equipment to a site.
- Receive customer purchase orders, direct the data coordinator to fill the order, and further coordinate all information with the data coordinator.

2.2 DATA COORDINATOR

The data coordinator shall:

- Prepare equipment purchase orders and send to appropriate vendors.

- Receive, label, log, and inventory all equipment.
- Enter inventory information in the equipment database.
- Assemble camera equipment and perform initial quality assurance checks.
- Ship camera and lenses to a local factory-authorized repair facility for a full system check.
- Load the camera with film (when returned from the repair facility) and take test photographs.
- Assemble the photographic system (camera, cables, timer, and batteries) and perform acceptance testing procedures.
- Assemble the camera enclosures, including documentation charts, camera tripods, security plates, standard setting and troubleshooting labels.
- Verify tripod placement and security of windows and doors in the camera enclosure.
- Assemble a site operator's manual and all necessary photographic monitoring supplies.
- Package and ship the photographic systems according to specifications.

3.0 REQUIRED EQUIPMENT AND MATERIALS

3.1 CAMERA SYSTEM TESTING

Equipment and materials required to test a camera system include:

- Camera
- Programmable timer
- Lens
- Winding system
- Camera databack
- UV filter
- Power and camera cables
- Batteries
- Kodachrome 64 color slide film
- Photographic log
- Battery jumper bar

- Documentation chart
- Environmentally-sealed and lockable enclosure
- Tripod mount
- Multi-plex camera tester (used at the factory-authorized repair facility)

3.2 INVENTORY

An up-to-date accounting of purchase and warranty information, location, and status of all field and laboratory equipment will be maintained. Primary accounting will be performed on an equipment database developed by ARS. The database can be searched and sorted by fields to yield reports such as equipment listings by site, equipment type, manufacturer, model number, serial number, property number, purchase order number, date purchased, or a variety of additional search fields.

Monthly updates of the equipment database will be routinely performed by the data coordinator. Purchase orders, repair records, and all other available sources of equipment status will serve as documentation of equipment database entries.

All equipment not being used at a monitoring site will be stored in a secure location at ARS. A detailed inventory of all items awaiting maintenance, testing, or future deployment will be maintained at all times. Items uneconomical for repair will be salvaged for parts.

4.0 METHODS

This section includes the following three (3) subsections:

4.1 Procurement
4.2 Acceptance Testing
4.3 Shipping

4.1 PROCUREMENT

4.1.1 Individual Components

Purchase orders (POs) are generated by the data coordinator and sent to the project manager for approval. Upon approval, the POs are sent to the appropriate equipment vendors. Equipment is inventoried and readied for testing after receipt at ARS.

After receiving the individual components, fabrication of a complete system may be required. Fabrication includes:

- Assembly of camera enclosure
- Assembly of integrated camera system for testing
- Assembly of site operator's manuals and operating supplies

4.1.2 Complete System

Purchase orders (POs) are generated by the data coordinator and sent to the project manager for approval. Upon approval, the POs are given to the instrument technician at ARS Technologies, Inc. The equipment is inventoried when received by the data coordinator. All 35 mm automatic camera systems purchased from ARS Technologies, Inc. have undergone thorough acceptance testing. All components are guaranteed.

4.2 ACCEPTANCE TESTING

Camera equipment purchased from a manufacturer will be subject to thorough inspection and acceptance testing upon receipt at ARS. These inspections will include full system checks and verifications to ensure that the equipment is operating properly.

4.2.1 Testing Cameras and Lenses

Upon receiving a camera and lens from a vendor, the following are performed:

- The lens is attached to the camera.
- Camera batteries are installed.
- The camera is configured for remote operation (e.g., on a Canon EOS 630, the standard grip would be removed and a remote jack grip installed).
- Basic camera and lens functions are verified.
- Warranty cards are completed.
- Serial numbers are entered into the equipment database.
- The camera and lens are both sent to a factory-authorized repair facility.

ARS has a long, established relationship with local factory-authorized repair facilities. These facilities provide prompt, thorough photographic testing and preventive maintenance and repair services, including ambient and cold testing of:

- Current draw
- Shutter speed and curtain travel time
- Automatic exposure accuracy
- Film transport
- Diaphragm operation
- Lens focus and disable soft focus mechanism

When the camera, lens, and testing documentation are returned from the repair facility, the camera is loaded with a 36-exposure roll of Kodachrome 64 color slide film and is taken to an outdoor location. The following sequence of test photographs are taken:

- Three photographs of the documentation chart, at apertures of 5.6, 8.0, and 11.0.
- Three photographs of a vista, at ground to sky ratios of 70:30, 50:50, and 30:70. Each set is taken at an aperture setting ranging from 4.0 to 11.0.
- The lens is set to "auto" focus and the above procedures are repeated.
- The last few frames on the roll are taken in several different directions at a ground to sky ratio of 50:50.

The composition of each test photograph, test photograph settings, and the camera and lens serial numbers are documented on a photographic log. An example of a completed photographic log for a camera test session is provided as Figure 4-1. Film is then sent in for processing. When test photographs are returned from processing, they are thoroughly reviewed for exposure consistency, databack imprinting clarity, and focus. If problems are noted they are returned to the repair facility for further evaluation or on the advice of the repair facility, returned to the manufacturer. Cameras that pass all tests are then tested as part of the integrated monitoring system.

4.2.2 Testing of Integrated Monitoring System Including Camera, Timers, Cables, and Batteries

Timers and cables are tested by assembling the entire camera system, including timer, cables, batteries, and camera. The timer is set to the current time, date, and alarm times. The cables and camera are attached and the system is observed for two days to ensure all components are functioning properly.

4.2.3 Testing Enclosures

The placement of the tripod mount is verified and adjusted if necessary. The window, door lock, and latches are checked to ensure the enclosure is secure and completely weatherproof.

4.3 SHIPPING

Integrated camera systems or individual components are packed for shipping following successful testing. All shipments will be made by the most expedient, cost-effective method, usually by UPS Ground service. Packing slips containing item description, serial number, quantity, weight, and insurance value for all shipments accompany each shipping container. A record of the shipment including a copy of the packing slip is kept on file by the data coordinator.

VISIBILITY NETWORK PHOTO LOG

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Camera:_____
Lens:_____
TEST ROLL

EXP. #		DATE	TIME	APERTURE	NOTES
1	Doc Chart			5.6	
2				8.0	
3				11.0	
4	Manual			4.0	Ratios 70/30 50/50 30/70
5					
6					
7				5.6	
8					
9					
10				8.0	
11					
12					
13				11.0	
14					
15					
16	Auto			4.0	
17					
18					
19				5.6	
20					
21					
22				8.0	
23					
24					
25				11.0	
26					
27					
28	Manual			8.0	50/50 ratio in 9 different directions
29					
30					
31					
32					
33					
34					
35					
36					

Figure 4-1. Example Photographic Log for Camera Test Session.

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QUALITY ASSURANCE/QUALITY CONTROL DOCUMENTATION SERIES	
TITLE	**PROCUREMENT AND ACCEPTANCE TESTING PROCEDURES FOR 8 MM AUTOMATIC CAMERA SYSTEMS**
TYPE	**TECHNICAL INSTRUCTION**
NUMBER	**4005-1001**
DATE	**NOVEMBER 1993**

AUTHORIZATIONS		
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REVISION HISTORY			
REVISION NO.	CHANGE DESCRIPTION	DATE	AUTHORIZATIONS
0.1	Minor format and equipment changes.	February 1996	

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LIST OF FIGURES

1.0 PURPOSE AND APPLICABILITY

This technical instruction (TI) describes the steps for procurement and acceptance testing of 8 mm photographic equipment. The primary purpose of acceptance testing is to ensure that all systems are fully functional and operating within acceptable limits when shipped to designated sites.

For the purpose of this TI, a full automatic 8 mm camera system consists of the following components:

- 8 mm movie camera with intervalometer
- Programmable timer and cabling
- Environmental enclosure with sunshield and internal locks
- Quick-release camera mount
- Documentation chart
- Instruction manuals and example forms
- Lens cleaning supplies
- Batteries
- Mounting post

2.0 RESPONSIBILITIES

2.1 PROJECT MANAGER

The project manager shall:

- Quote camera specifications, prices, and delivery times to purchasing agents.
- Obtain information regarding specific equipment needed.
- Obtain site information, contact person's name, telephone number, shipping address, and any other special instructions needed to ship equipment to a site.
- Receive customer purchase orders, direct the data coordinator to fill the order, and further coordinate all information with the data coordinator.

2.2 DATA COORDINATOR

The data coordinator shall:

- Prepare equipment purchase orders and send to appropriate vendors.
- Receive, label, log, and inventory all equipment.

- Enter inventory information in the equipment database.
- Assemble camera equipment and perform initial quality assurance checks.
- Ship camera and lenses to a local factory-authorized repair facility for a full system check.
- Assemble the photographic system (when returned from repair facility) including camera, cables, timer, and batteries, and perform acceptance testing procedures.
- Assemble the camera enclosures, including documentation charts, camera tripods, security plates, standard setting and troubleshooting labels.
- Verify tripod placement and security of windows and doors in the camera enclosure.
- Assemble a site operator's manual and all necessary photographic monitoring supplies.
- Package and ship the photographic systems according to specifications.

3.0 REQUIRED EQUIPMENT AND MATERIALS

3.1 CAMERA SYSTEM TESTING

Equipment and materials required to test a camera system include:

- Camera
- Programmable timer
- Power and camera cables (power cable internally wired into the camera)
- Batteries
- Kodachrome 40 super 8 movie film
- Photographic log
- Battery jumper bar
- Documentation chart
- Environmentally-sealed and lockable enclosure
- Tripod mount
- Camera text box

3.2 INVENTORY

An up-to-date accounting of purchase and warranty information, location, and status of all field and laboratory equipment will be maintained. Primary accounting will be performed on an equipment database developed by ARS. The database can be searched and sorted by fields to yield reports such as equipment listings by site, equipment type, manufacturer, model number, serial number, property number, purchase order number, date purchased, or a variety of additional search fields.

Monthly updates of the equipment database will be routinely performed by the data coordinator. Purchase orders, repair records, and all other available sources of equipment status will serve as documentation of equipment database entries.

All equipment not being used at a monitoring site will be stored in a secure location at ARS. A detailed inventory of all items awaiting maintenance, testing, or future deployment will be maintained at all times. Items uneconomical for repair will be salvaged for parts.

4.0 METHODS

This section includes the following three (3) subsections:

4.1 Procurement
4.2 Acceptance Testing
4.3 Shipping

4.1 PROCUREMENT

4.1.1 Individual Components

Purchase orders (POs) are generated by the data coordinator and sent to the project manager for approval. Upon approval, the POs are sent to the appropriate equipment vendors. Equipment is inventoried and readied for testing after receipt at ARS.

All procurement, acceptance testing, and delivery will be performed within six (6) weeks of the written request. Timely completion of all requests is subject to the availability of the requested monitoring equipment.

After receiving the individual components, fabrication of a complete system may be required. Fabrication includes:

- Assembly of camera enclosure
- Assembly of integrated camera system for testing
- Assembly of site operator's manuals and operating supplies

4.1.2 Complete System

Purchase orders (POs) are generated by the data coordinator and sent to the project manager for approval. Upon approval, the POs are given to the instrument technician at ARS Technologies, Inc. When the equipment is received by the data coordinator it is inventoried. All 8 mm automatic camera systems purchased from ARS Technologies, Inc. have undergone thorough acceptance testing. All components are guaranteed.

4.2 ACCEPTANCE TESTING

Camera equipment purchased from a manufacturer will be subject to thorough inspection and acceptance testing upon receipt at ARS. These inspections will include full system checks and verifications to ensure that the equipment is operating properly.

4.2.1 Testing Cameras, Timers, and Cables

Upon receiving a camera from a vendor, the following are performed:

- Temporary camera batteries are installed.
- Basic camera functions are verified.
- Warranty cards are completed.
- Serial numbers are entered into the equipment database.
- Camera is sent to a factory-authorized repair facility.

ARS has a long, established relationship with local factory-authorized repair facilities. These facilities provide prompt, thorough photographic testing and preventive maintenance and repair services, including testing of:

- Current draw
- Shutter speed
- Automatic exposure accuracy
- Film transport
- Lens focus

When the camera, lens, and testing documentation are returned from the repair facility, the following procedures are performed:

- The camera is configured for remote operation (e.g., on a Minolta XL-401/601, the internal batteries are removed and replaced with internal wiring).
- The camera is loaded with Kodachrome 40 super 8 movie film.
- The fully integrated system (camera, timer, and cables) is assembled in a test box.
- The camera is set to standard settings.
- The intervalometer is set at a 60-second interval.
- The timer is set to operate the camera for 8 hours a day.

- The camera is mounted in the test box to film an outdoor vista with a ground to sky ratio of 50/50.

- The timer and cables are observed for proper function.

- The camera is removed when the film cartridge is fully exposed (approximately 7 days).

Test photograph settings and the camera serial number are documented on an 8 mm photographic test log. An example of a completed 8 mm photographic log for a camera test session is provided as Figure 4-1. Film is then sent in for processing. When test film is returned from processing, it is thoroughly reviewed for exposure consistency and focus. If problems are noted the camera is returned to the repair facility for further evaluation, or on the advice of the repair facility, returned to the manufacturer.

4.2.2 Testing Enclosures

The placement of the tripod mount is verified and adjusted if necessary. The window, door lock, and latches are checked to ensure the enclosure is secure and completely weatherproof.

4.3 SHIPPING

Integrated camera systems or individual components are packed for shipping following successful testing. All shipments will be made by the most expedient, cost-effective method, usually by UPS Ground service. Packing slips containing item description, serial number, quantity, weight, and insurance value for all shipments accompany each shipping container. A record of the shipment including a copy of the packing slip is kept on file by the data coordinator.

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CAMERA TEST FORM - 8 MM

STARTING DATE _____ TIME _____

TYPE OF 8 MM CAMERA _____

SERIAL NUMBER _____

TYPE OF TIMER _____

SERIAL NUMBER _____

SETTINGS (if other than standard) _____

_____

ENDING DATE _____ TIME _____

PROBLEMS/COMMENTS _____

_____

_____

_____

_____

_____

_____

Figure 4-1. Example Photographic Log for Camera Test Session.

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QUALITY ASSURANCE/QUALITY CONTROL DOCUMENTATION SERIES	
TITLE	**PROCUREMENT AND ACCEPTANCE TESTING OF SVHS TIME-LAPSE VIDEO CAMERA SYSTEMS FOR THE HEALY CLEAN COAL PROJECT**
TYPE	**TECHNICAL INSTRUCTION**
NUMBER	**4005-1050**
DATE	**SEPTEMBER 1998**

AUTHORIZATIONS		
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REVISION HISTORY			
REVISION NO.	CHANGE DESCRIPTION	DATE	AUTHORIZATIONS

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1.0 PURPOSE AND APPLICABILITY

This technical instruction (TI) describes the steps for procurement and acceptance testing of SVHS time-lapse video monitoring equipment for the Healy Clean Coal Project Visibility Monitoring Program. The primary purpose of acceptance testing is to ensure that all systems are fully functional and operating within acceptable limits when shipped to designated sites.

For the purpose of this TI, a full SVHS time-lapse video camera system consists of:

- A high-resolution color video camera with lens.
- A programmable SVHS recorder, video monitor, and cabling.
- An environmental enclosure for the video camera with sunshield and security lock.
- A camera mount.
- Instruction manuals and example forms.
- Lens cleaning supplies.

2.0 RESPONSIBILITIES

2.1 PROJECT MANAGER

The project manager shall:

- Develop camera system specifications, price ranges, and delivery times.
- Obtain information regarding specific equipment needed.
- Obtain site information, contact person's name, telephone number, shipping address, and any other special instructions needed to ship equipment to a site.
- Coordinate purchasing with the data coordinator.
- Coordinate acceptance testing with the field specialist.

2.2 DATA COORDINATOR

The data coordinator shall:

- Prepare equipment purchase orders as directed by the project manager and send the orders to appropriate vendors.
- Receive, label, log, and inventory all equipment.
- Maintain inventory information in the equipment database.

2.3 FIELD SPECIALIST

The field specialist shall:

- Assemble the SVHS time-lapse video system, including camera, cables, monitor, and SVHS recorder, and perform acceptance testing procedures.
- Assemble the camera enclosures, including heaters, camera mounts, and security plates, and perform acceptance testing procedures.
- Assemble a site operator's manual and all necessary SVHS time-lapse video monitoring supplies.
- Package and ship the SVHS time-lapse video systems according to specifications.

2.4 HSE COMMUNICATIONS TECHNICIAN

The microwave technician from HSE Communications shall acceptance test the microwave system.

3.0 REQUIRED EQUIPMENT AND MATERIALS

Equipment and materials required to test an SVHS time-lapse video system include:

- A high-resolution color video camera with lens.
- A programmable SVHS video recorder.
- A color video monitor.
- Power and signal cables.
- A cross-polarizing lens filter.
- A camera enclosure.
- SVHS videocassettes.
- A voltmeter.
- An SVHS Time-Lapse Video System Test Log.

4.0 METHODS

This section includes the following four (4) subsections:

4.1 Procurement
4.2 Acceptance Testing
4.3 Inventory
4.4 Shipping

4.1 PROCUREMENT

Purchase orders (POs) for system components or fully integrated systems are generated by the data coordinator and sent to the project manager for approval. Upon approval, the POs are sent to the appropriate equipment vendors. Upon arrival, equipment is cross-checked against the PO and readied for acceptance testing.

All procurement, acceptance testing, and delivery will be performed within six (6) weeks of the written request. Timely completion of all requests is subject to the availability of the requested monitoring equipment.

After receiving the system components, fabrication of a complete system by an ARS field specialist may be required. Fabrication includes:

- Assembly of the integrated SVHS video system for testing.
- Assembly of the camera enclosure.
- Assembly of site operator's manuals and operating supplies.

4.2 ACCEPTANCE TESTING

SVHS video equipment purchased from a manufacturer will be subject to thorough inspection and acceptance testing upon receipt at ARS. These inspections will include individual component and full system checks to verify that the equipment is operating within manufacturer’s specifications. The results of video system tests are documented on an SVHS Time-Lapse Video System Test Log (see Figure 4-1). Test procedures for system components are discussed in the following subsections.

4.2.1 Component Tests

The following component tests are performed:

Camera and lens:
- Basic camera functions
- Lens focus
- Automatic exposure accuracy
- Remote control functionality
- Cable/connector integrity

SVHS recorder:
- Basic recorder functions
- Tape speed and mechanical integrity and cleanliness of the tape drive
- VCR programming and operation
- Date and time displays
- Cable/connector integrity

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SVHS TIME-LAPSE VIDEO SYSTEM TEST LOG

STARTING DATE: _____ TIME: _____

SYSTEM COMPONENTS (list camera, recorder, enclosure, mount, and other components):

Component	Model No.	Serial No.	Component Test Comments

SETTINGS (if other than standard):

_____
_____
_____
_____
_____

TEST COMMENTS/PROBLEMS:

_____
_____
_____
_____
_____
_____

ENDING DATE: _____

Figure 4-1. SVHS Time-Lapse Video System Test Log.

Monitor:
- Basic monitor functions
- Color and contrast
- Resolution display options
- Cable/connector integrity

Enclosures:
- Latches and seals to ensure that the system is weatherproof
- Climate control functions of:
  - Thermostat
  - Heaters
  - Vent fans
- Cable/connector integrity

Camera mount:
- Basic mount functions
- Remote control functionality
- Camera mount heater
- Cable/connector integrity

All component test information is logged on the SVHS Time-Lapse Video System Test Log. If problems are noted, the malfunctioning unit is repaired by ARS, returned to the supplier for repair, or at the advice of the supplier, returned to the manufacturer. All components passing the acceptance tests are integrated into a SVHS monitoring system and further tested as described below.

4.2.2 System Tests

Components are fully integrated into a field ready system and further tested as follows:

- The camera is mounted in the camera enclosure and placed outdoors to film an outdoor vista.

- The camera is configured for remote operation as it will be applied in the field monitoring program.

- The lens is focused on the selected vista using the monitor to verify the focus.

- The recorder is loaded with an SVHS videocassette and programmed as it will be applied in the field monitoring program.

- A 1-hour test is initially performed to ensure that the integrated system is working properly. Any noted inconsistencies are resolved.

- A 48-hour operational test is then performed during which the operation of all components are observed.

- Following the 48-hour test, the videotape is thoroughly reviewed for timing, exposure consistency, and focus.

If problems are noted, the system and its individual components are reevaluated. Problems are resolved by repair or replacement of malfunctioning or incompatible components.

4.2.3 Supporting Hardware

All supporting hardware (e.g., nuts, bolts, connectors, etc.) is checked, inventoried, and packaged to assure that all required hardware is available for installation. If special brackets, posts, or other support systems are required, or if modifications to standard components are necessary, they are fabricated and tested by ARS.

4.3 INVENTORY

An up-to-date accounting of purchase and warranty information, location, and status of all purchased equipment will be maintained. Primary accounting will be performed in The ARS Purchase Order/Inventory Database. The database can be searched and sorted by fields to yield reports such as equipment listings by site, equipment type, manufacturer, model number, serial number, property number, purchase order number, date purchased, or a variety of additional search fields.

Monthly updates of the equipment database will be routinely performed by the data coordinator. Purchase orders, repair records, and all other available sources of equipment status will serve as documentation of equipment database entries.

All equipment not being used at a monitoring site will be stored in a secure location at ARS. A detailed inventory of all items awaiting maintenance, testing, or future deployment will be maintained at all times. Items uneconomical for repair will be salvaged for parts.

4.4 SHIPPING

Integrated SVHS time-lapse video camera systems or individual components are packed for shipping following successful testing. All shipments will be made by the most expedient, cost-effective method. Packing slips containing item description, serial number, quantity, weight, and insurance value for all shipments accompany each shipping container. A record of the shipment including a copy of the packing slip is kept on file by the data coordinator.