

To Activate Electric Chair

- A. Turn on exhaust fan.
- B. Turn on power supply at junction box by throwing switch to on position.
- C. Using key, switch on electric chair control module in the following sequence:
 - 1. Power on.
 - 2. Computer on.
 - 3. Electric chair failsafe to OPERATION.
 - 4. Energize electric chair control switch.
- D. Upon completion of cycle, begin shutdown in the following order:
 - 1. Return chair failsafe to OFF
 - 2. Computer off.
 - 3. Power off.
 - 4. Turn off power supply at junction box by throwing switch to off position.

LEAVE EXHAUST FAN ON!!!

Note: In case of emergency, upon direction of Warden, throw power switch to off and await instructions.

1997

1998

DATE	TESTED TWICE	VOLTS	AMPS
JAN 9	TESTED TWICE NO PROBLEMS NOTED	2640 1350 on load	8
JAN 30	TESTED TWICE NO PROBLEMS	2640 1350 on load	8
NOV 13	TESTED TWICE NO PROBLEMS	2640 1350 on load	8
JULY 14	TESTED TWICE NO PROBLEMS NOTED <i>Cheney</i>	2640 1350 on load	8
NOV 18	No Problems	2640 1350 on load	8

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1996		VOLTS	AMPS
APR 27	TEST OK	2640	7.5
MAY 13	TEST OK	2640	8.2
NOW 17	TEST OK	2640	8.0
	<u>CLOSING</u>		

2000

1999

		VOLTS	Ames
Feb 10	1800	1750	7
	2640		
	1750	1750	7
May 5	2640		
	1750	1750	7
Sept 18	2640		
	1750	1750	7
Dec 15	2640		
	1750		

Tested twice
no problems noted

Tested twice
no problems

Tested twice
no problems

Tested twice
no problems

1800
2640

1750
2640

1750
2640

2640
1750

2640
1750

Feb 17

June 28

Sept 07

Dec 15

Ames
8

no load
8

no load
8

8
out load

8
out load

2001

Month	Day	Volts	Amps	Notes	Volts	Amps
Feb	14	17.50	7		17.50	7
Feb	21	17.50	7		17.50	7
Feb	28	17.50	7		17.50	7
June	20	17.50	7		17.50	7
Sept	12	17.50	7		17.50	7
Dec	12	17.50	7		17.50	7
March	20					
June	26					
Sept	4					
Nov	13					

Tested twice
no problems noted

2002

Month	Day	Volts	Amps	Notes	Volts	Amps
Feb	14	17.50	7		17.50	7
Feb	21	17.50	7		17.50	7
Feb	28	17.50	7		17.50	7
June	20	17.50	7		17.50	7
Sept	12	17.50	7		17.50	7
Dec	12	17.50	7		17.50	7

2003

	Volts	Amperes
Feb 8	17.50	7
March 19	17.50	7
April 16	17.50	7
July 23	17.50	7
Nov. 19	17.50	7

Tested twice
no problems noted

2004

	Volts	Amperes
March 29	17.50	7
April 14	17.50	7
June 7	17.50	7
August 18	17.50	7
Nov. 10	17.50	7

10

2005

	Volts	Amps
Feb 16	17.50	7
Apr 15	17.50	7
Apr 17	17.50	7
Nov. 16	17.50	7

11

2006

	Volts	Amps
Jan 18	17.50	7
Feb 3	17.50	7

2006000

2007

2006

	Volts	Ames
Oct 18	17.50	7
Dec 13	17.50	7
Jan 13	17.50	7
Feb 13	17.50	7
Mar 13	17.50	7
Apr 13	17.50	7
May 13	17.50	7
Jun 13	17.50	7
Jul 13	17.50	7
Aug 13	17.50	7
Sep 13	17.50	7
Oct 13	17.50	7
Nov 13	17.50	7
Dec 13	17.50	7

Total 7

Total 7

	Volts	Ames
Jan 08	17.50	7
Feb 08	17.50	7
Mar 08	17.50	7
Apr 08	17.50	7
May 08	17.50	7
Jun 08	17.50	7
Jul 08	17.50	7
Aug 08	17.50	7
Sep 08	17.50	7
Oct 08	17.50	7
Nov 08	17.50	7
Dec 08	17.50	7

Total 7

Total 7

2007

2008

Prof
Volts
Amperes

Prof
Volts
Amperes

Sept 5

Sept 12

Sept 20

Sept 27

7

7

7

7

7

7

7

7

17.50

17.50

17.80

19.50

02.51

17.50

02.51

17.50

02.51

17.50

02.51

17.50

Tested twice
no problems detected

Tested backup system
no problems detected

2009

Date	Volts	Amps	Notes
Mar 15	17.50	7	
July 15	17.50	7	
Sept 3	17.50	7	
			Tested twice No Problems
			Tested back-up system No problems noted
Oct 14	17.50	7	

2010

Date	Volts	Amps	Notes
Feb 10	17.50	7	
April 21	17.50	7	
July 14	17.50	7	
Sept 30	17.50	7	
			Tested twice No Problems
			Tested back-up system No Problems noted
	17.50	7	

2011 RICE

Volts Amps

STATION

DATE	VOLTS	AMPS	REMARKS
Jan 19	1780	7	
April 20	1250	9	Tested once in position
July 20	1250	9	Tested once in position
Sept 14	1250	9	Tested once in position
Jan 18			2012 Tested once in position
April 18			Tested with equipment 1250

2012

Volts

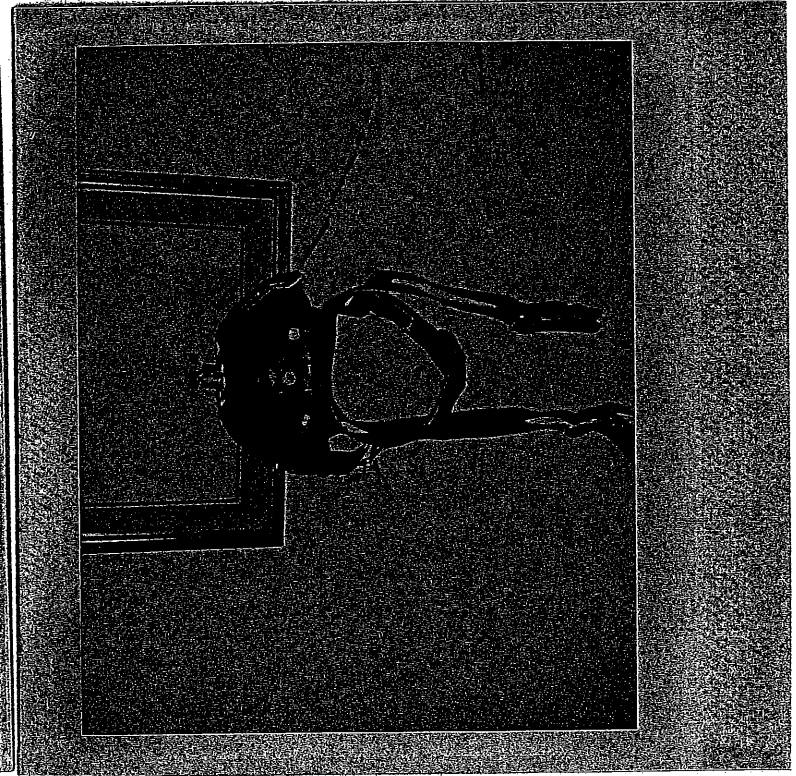
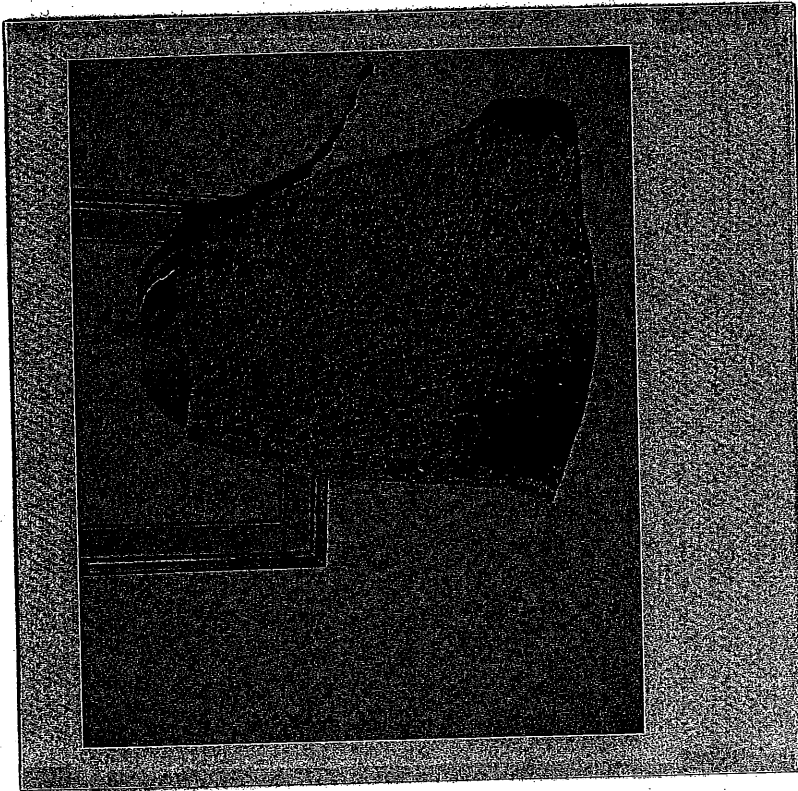
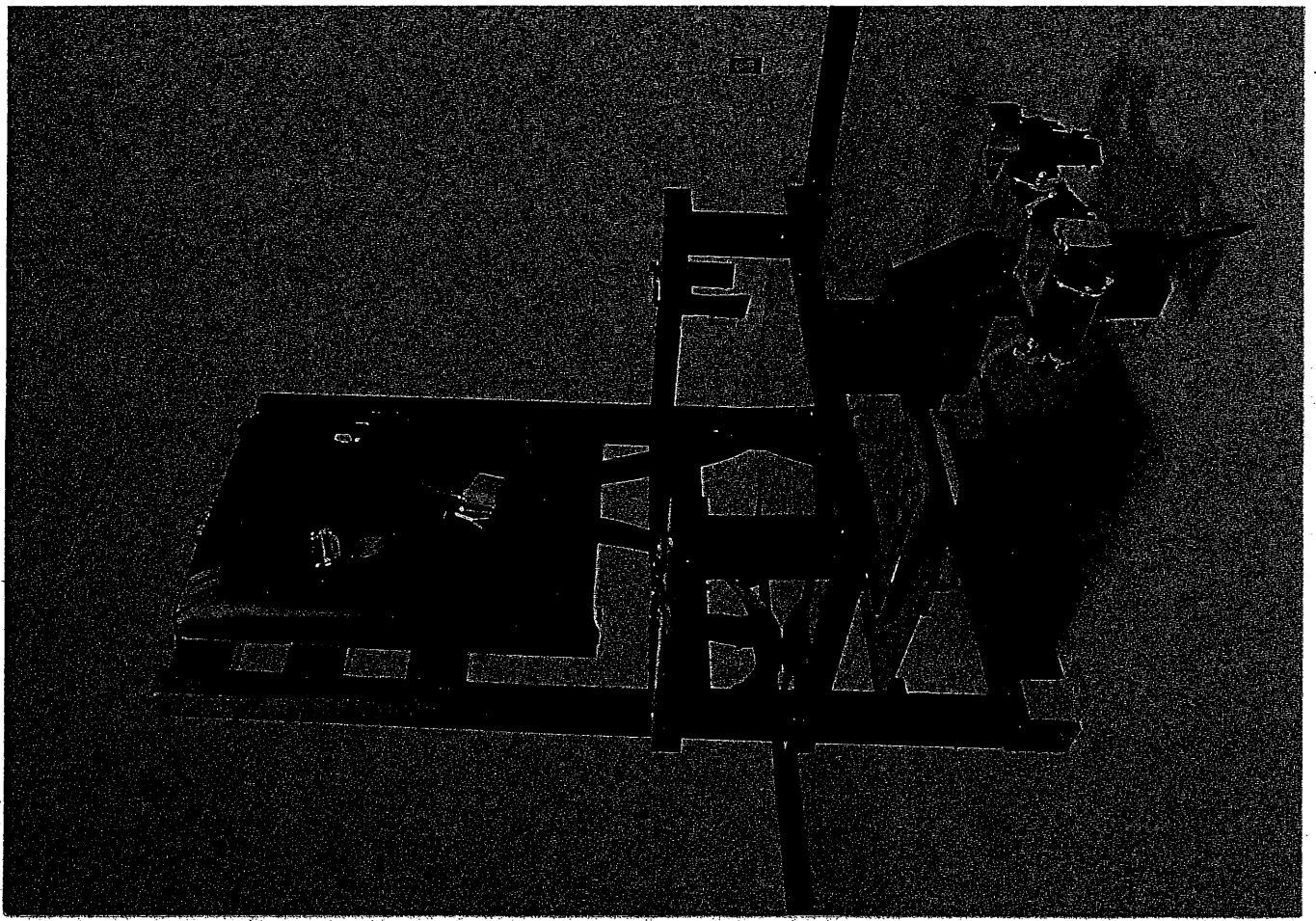
Amps

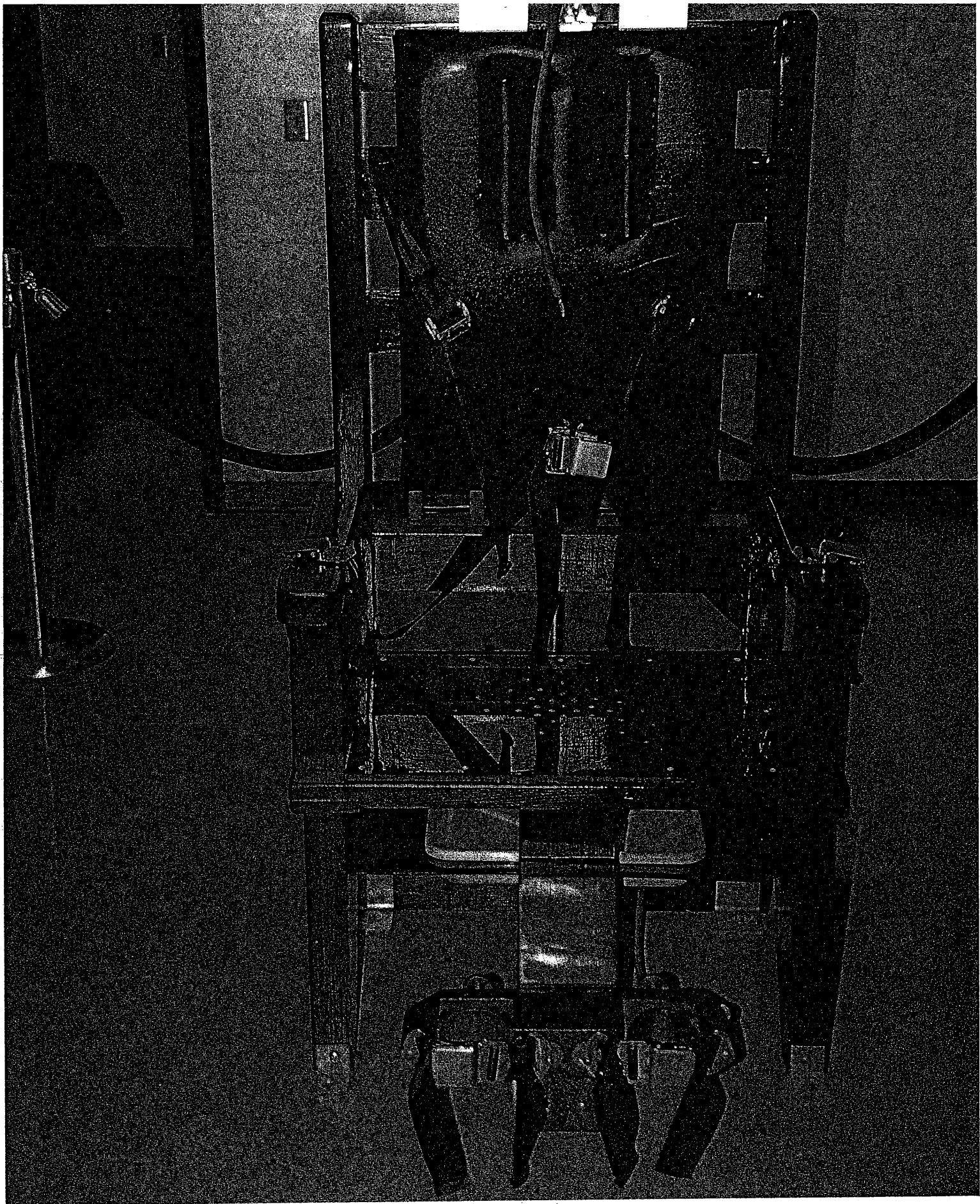
DATE	VOLTS	AMPS	REMARKS
Jan 19	1250	9	Tested twice in position Battery system tested in position
April 18			2012 Tested once in position

2013

Volts Amps

Date	Volts	Amps	Notes
Aug 7	1750	7	Tested once - no problem
Sept 6	1750	7	Complete test + inspection Sump tested + inspected NO PROBLEM - Annual test
Nov 19	1750	7	Tested once - no problem quarterly test
March 21	1750	7	Tested once - no problem quarterly test
June 18	1750	7	Tested once - no problems Quarterly test







ELECTRIC CHAIR CONTROL
SYSTEM

ELECTRIC CHAIR RELEASED
ELECTRIC CHAIR PAUSE

POWER
ALARM

POWER
ALARM

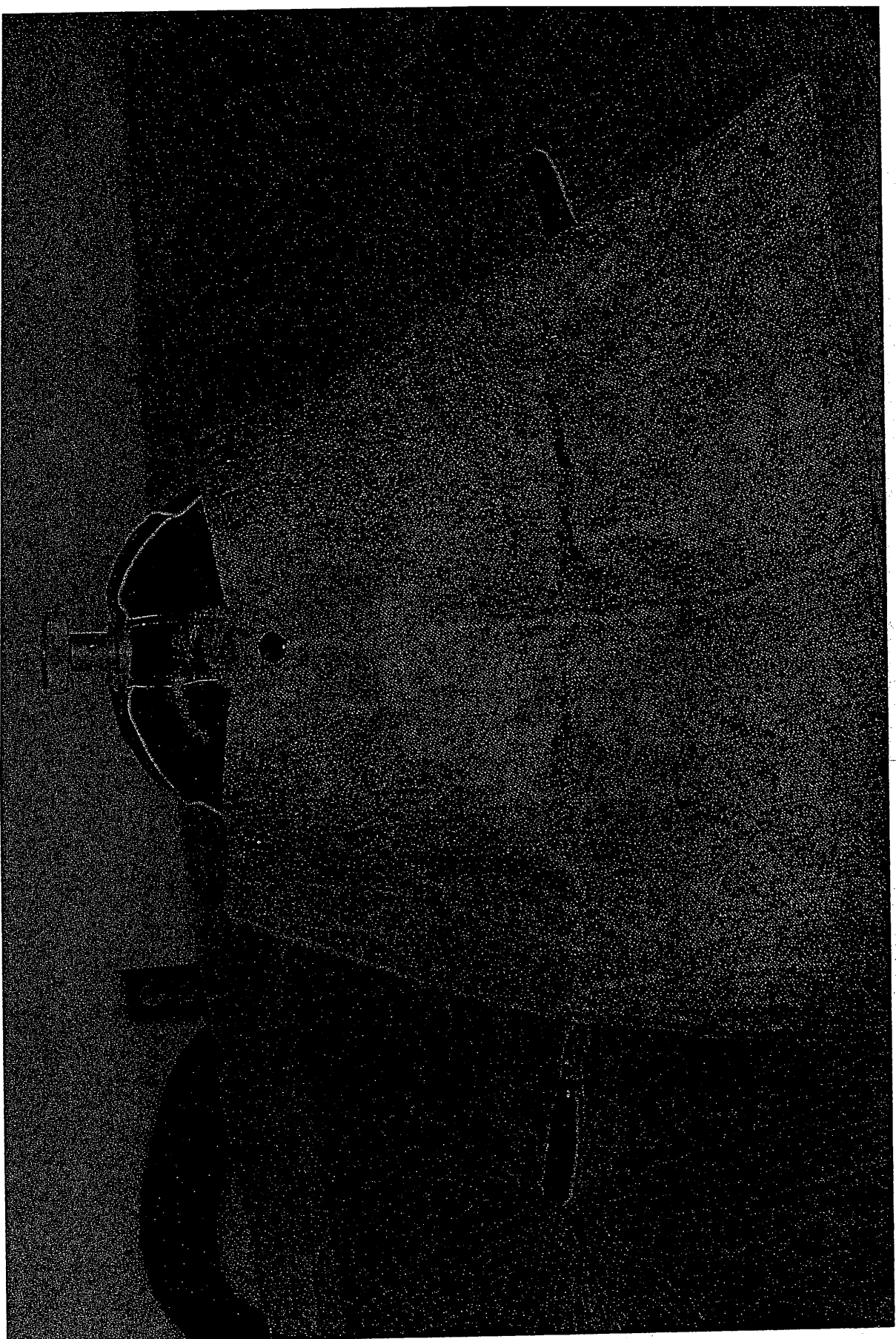
ELECTRIC CHAIR CONTROL

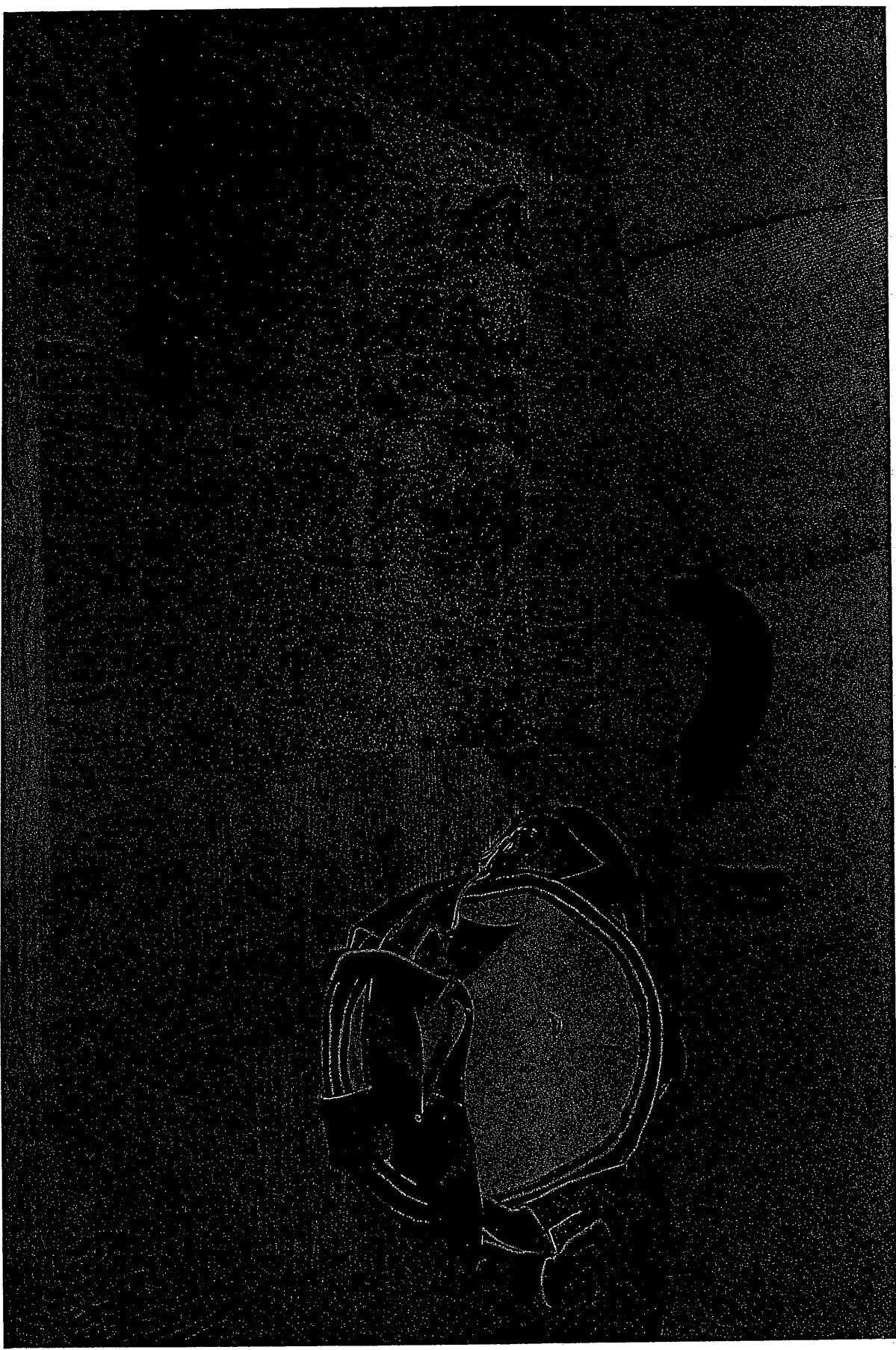
SYSTEM ON 

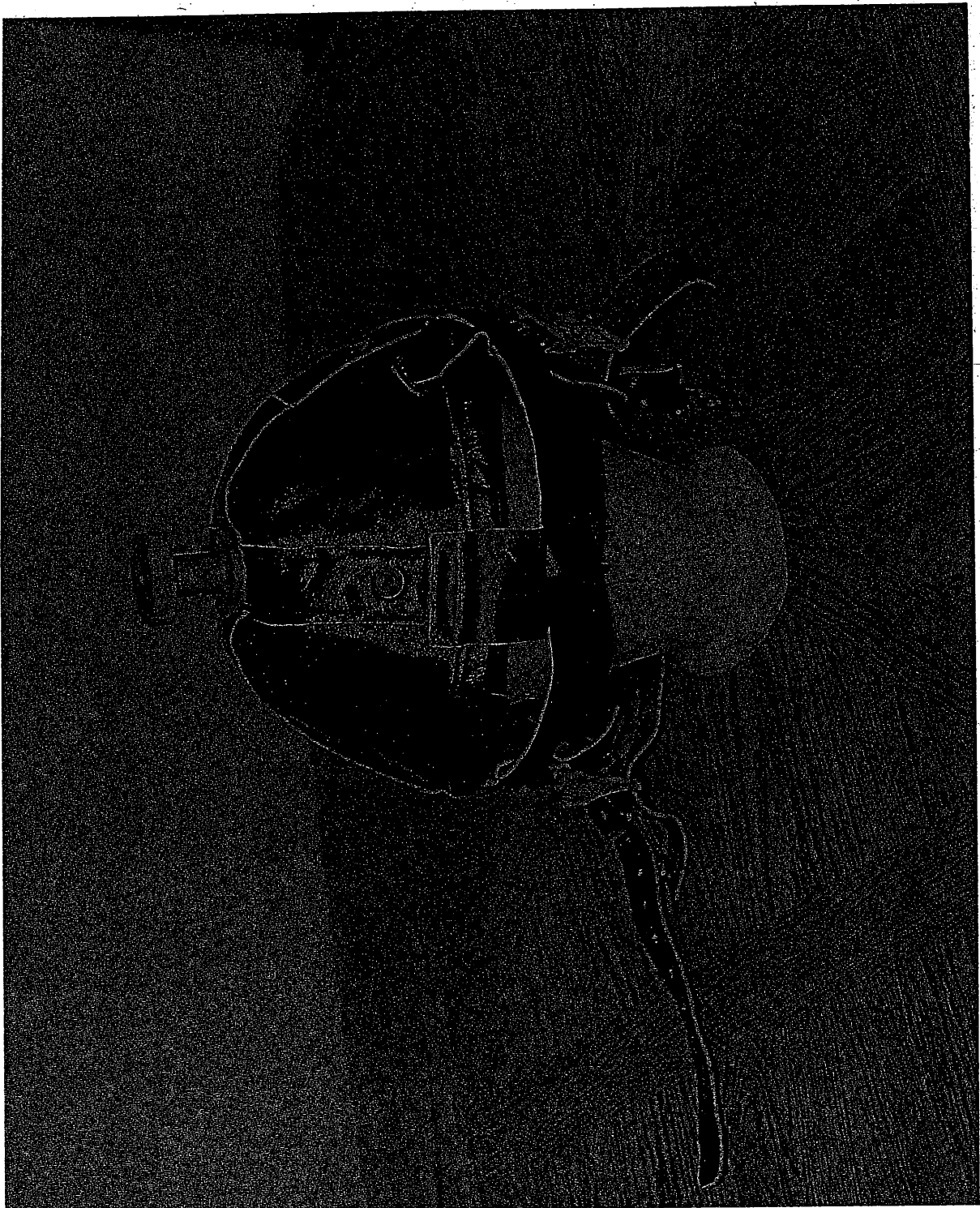
POWER ON  COMPUTER ON  ELECTRIC CHAIR ENERGIZED 

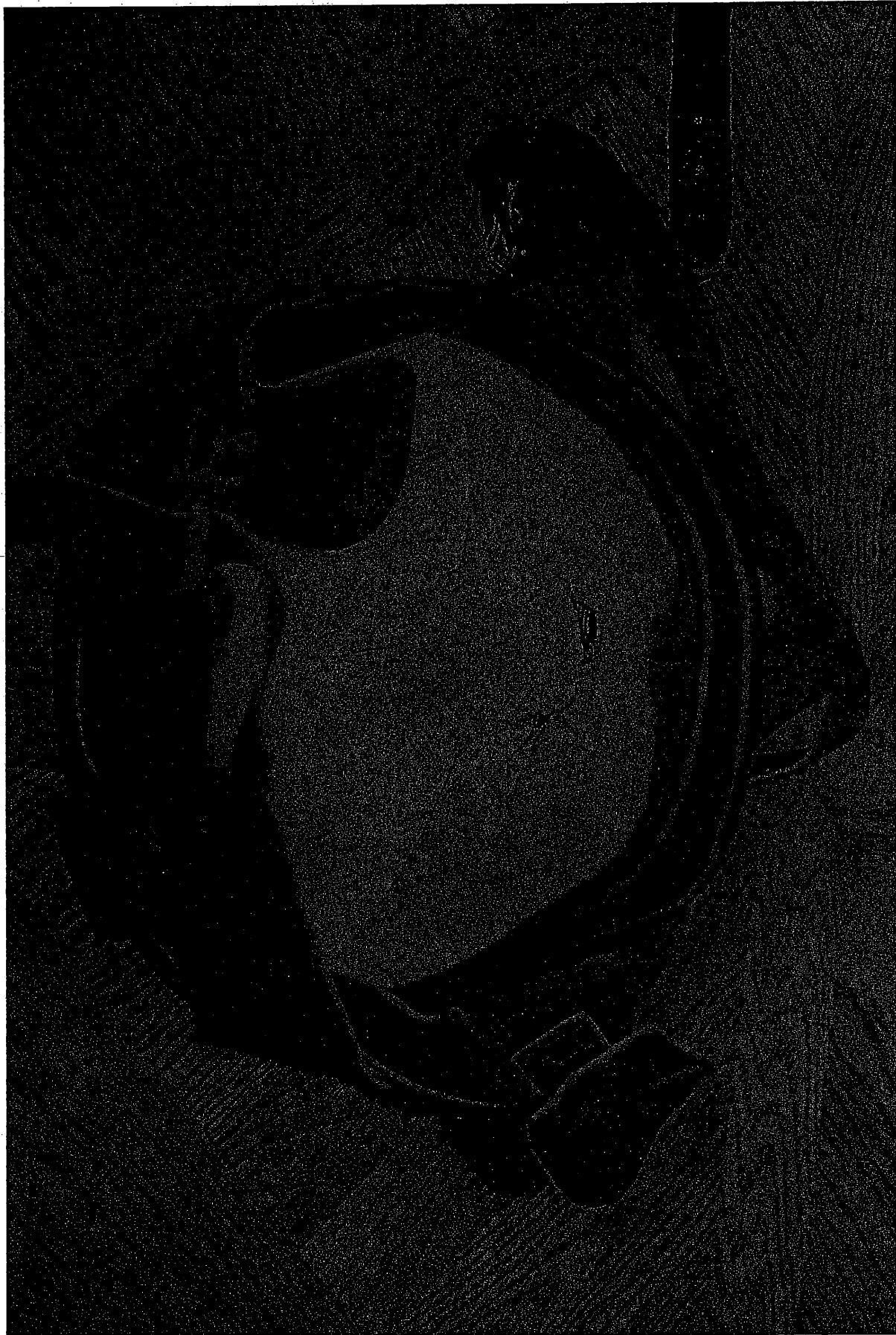
SINGLE  DOUBLE  OPERATION OFF 

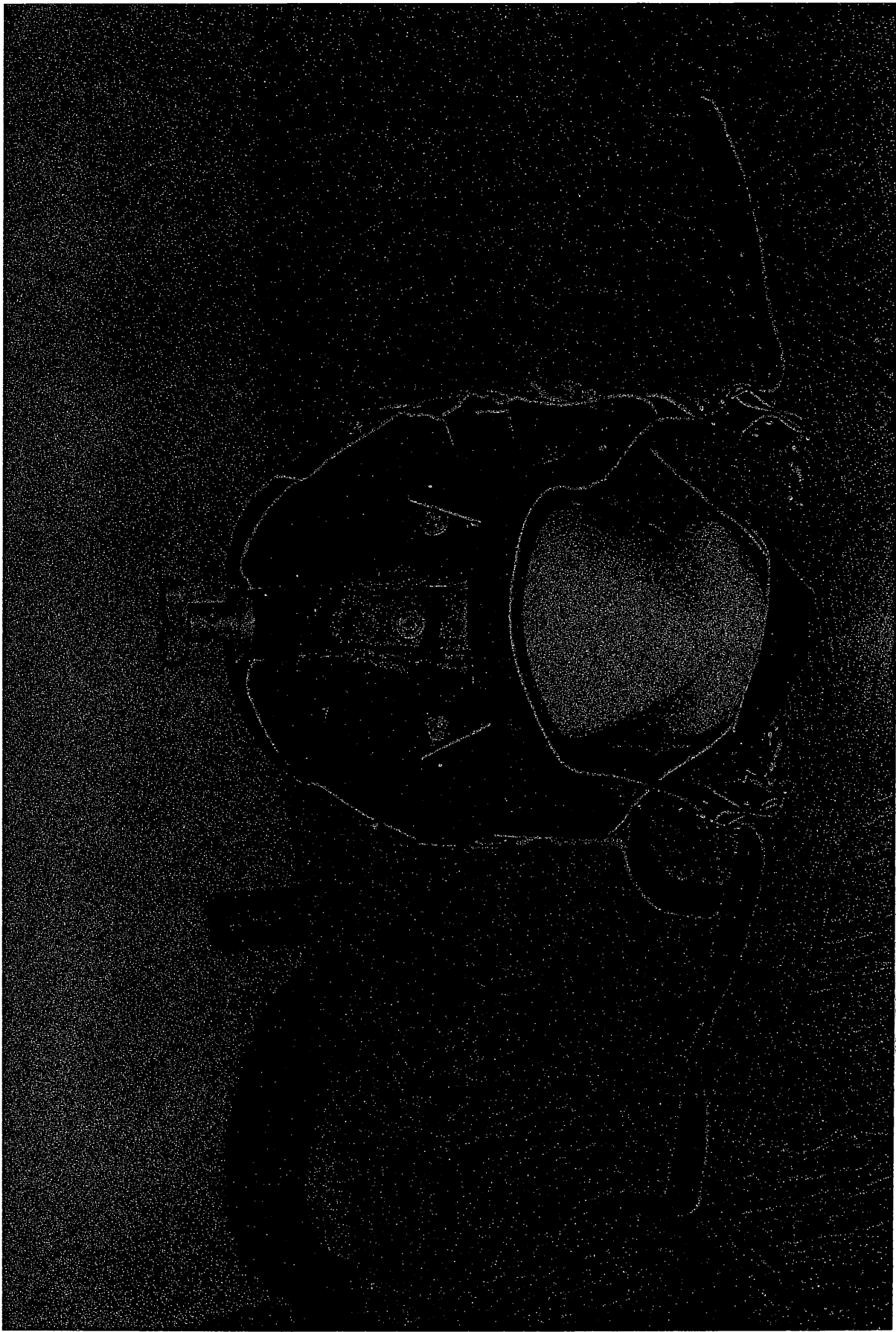
ELECTRIC CHAIR FAILSAFE











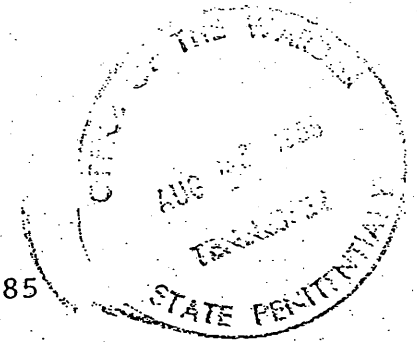


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100. 110V AC



American Engineering, Inc.

Office: 265 Main Street
Engineering Facilities: 108 Bunker Hill Street
Boston, Massachusetts 02129
(617) 242-0385



August 20, 1985

Warden Michael Dutton
Tenn. State Penitentiary
Station A
Nashville, Tenn. 37203

Dear Michael,

American Engineering, Inc. is a consulting engineering and hardware fabricating firm located in Boston, Massachusetts. In the past, it has been engaged in the design and fabrication of execution devices for state governments enforcing capital punishment. Entry in to the market was determined by a requirement to standardize hardware and procedures, reduce costs and eliminate problems and complications inherent in executions. Most of the equipment in use today is a quarter of a century old, or older, and although operating, is either sub-standard, imprecise or problematical from a medical standpoint. Our aim is to offer hardware and personal support in all phases of the problem, not limited to, but including, technical assistance in the field. We are prepared to address any problems you might pose, and research any problems you might have, not only via letter or telephone but by actual physical inspection, certification, repair, maintenance and set-up of your hardware and systems for use, prior to, and during, any execution. We are familiar with most systems and procedures and are prepared to discuss any problems or reservations you might have.

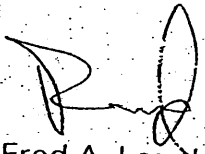
Specifically, we can supply any hardware, design, modifications or complete systems needed, and further, back-up said systems and hardware with support. We can test and certify your system and equipment prior to its use and be present during its use to ensure proper function. We have a successful track record in the field and a complete, computerized lethal injection system in place at the New Jersey State Prison in Trenton.

Enclosed is a description of our Modular Electrocutation System, the only state of the art system available today. This system will minimize your problems and ensure trouble free electrocutions. It has been designed utilizing the best medical and engineering expertise available and has been thoroughly considered from a human factors, legal and public standpoint to minimize error and guarantee ease in operation.

Further, after installation of the system, we can supply support by testing and certifying the system as operational prior to each use, eliminating the human apprehension caused by infrequent use of the system. In this case, your people need only connect the subject to the system and the executioners perform their mechanical function.

I will be in touch with you in the near future in the hope that we may assist you in your needs.

Very truly yours,
American Engineering, Inc.



Fred A. Leuchter, Jr.
Chief Engineer

The American Engineering Modular Electrocutation System

The design of an electrocutation system involves the consideration of a few, but very significant requirements. Voltage, current, connections, duration and number of current applications (jolts).

Requirements

First, the system should contain three electrodes. The head of the subject should be fitted with a tightly fitting cap containing an electrode with a saline solution moistened sponge. It is through this electrode that the current is introduced. Second, each ankle should be tightly fitted with an electrode, causing the current to divide and guaranteeing passage through the complete trunk of the subjects body. The two ankle electrodes are the return path of the current. Contact should be enhanced by using saline salve at the connections. It is of the utmost importance that good continuity, with a minimum amount of resistance, be maintained at the electrode contacts. Further, a minimum of 2000 volts ac must be maintained after voltage drop to guarantee permanent disruption of the functioning of the autonomic nervous system. Voltages lower than 2000 vac, at saturation, cannot guarantee heart death and are thus not adequate for electrocutation in that they may cause unnecessary trauma to the subject prior to death.

Medical Description

During electrocutation there are two factors that must be considered: the conscious and autonomic nervous systems. Voltages in excess of 1500 vac are generally sufficient to destroy the conscious nervous system, that which controls pain and understanding. Generally, unconsciousness occurs in 4.16 milliseconds, which is 1/240 part of a second. This is twenty-four times as fast as the subjects conscious nervous system can record pain. The autonomic nervous system is a little more difficult, however, and generally requires voltages in excess of 2000 volts ac to seize the pacemaker in the subjects heart. Generally, we compute the voltage at 2000 volts ac plus 20%. After the voltage is applied and the subjects body saturates, the voltage has dropped about 10% (depending upon the resistance of the electrode contacts and that of the subjects body) and this should be taken into consideration, as well. Current should be kept under six amperes to minimize body damage (cooking).

Ideally, the voltage is calculated thus:

The average man weighing 70 kilos (154 lbs.) requires 2000 vac to seize the heart.

Increase the voltage by 20% to accommodate subjects with greater resistance.

2000 vac plus 20% equals 2400 vac.

Increase voltage by 10% for drop at saturation.

2400 vac plus 10% equals 2640 vac.

Thus the voltage should be 2640 vac.

2640 vac should be applied in two jolts on one minute each, spaced at a ten second interval. On occasion the subjects heart will spasm, instead of seizing, during the first application of current and the application of the second jolt will generally eliminate this problem. This spasm is due to excessive chemical build-up (acetylcholine and sympathin) at the nerve junctions and the ten second wait generally allows for dissipation of the chemicals.

System Description

American Engineering, Inc. manufactures a low cost, state of the art modular system for electrocution. The system utilizes solid state circuitry for control and timing, current regulation to 5 milliamperes and single and two station control for operation. It is designed with plug-in components for ease in repair and maintenance and because of its modular design can be installed in very little time by untrained personnel.

The control system is designed for a timing sequence which will deliver two one minute jolts at 2400 volts ac spaced ten seconds apart. To guarantee failsafe operation a redundant system's timer activates and shuts down the system if any of the sequential timers fail. Additionally, there are two modes of operation: single station and two station. In single station, one push button switch controls the operation. In two station, two switches are utilized and logic circuitry determines which switch causes operation. The two station mode precludes the use of an executioner, since no one knows which of the two switches activated the system. The system does not retain the operating switch in memory. Further, since the controls are operated electronically, the operator handles only low voltage equipment, being completely isolated from the high voltage, guaranteeing operator safety.

The high voltage circuitry is designed to deliver 2640 volts ac upon activation and, as the load saturates and the current increases, the voltage stabilizes at 2400 volts ac. The current is limited to 5 amperes, maximum, by a current regulator. The voltage, in accordance with the standard formula for admittance, will drop approximately 10% or 240 volts but the current will never exceed 5 amperes with 0.1% (5 milliampere) regulation. A current limiting breaker protects the load in the event of a regulator failure and will open the circuit at 6 amperes. The equipment is protected by a 90 ampere overcurrent breaker.

The Power Supply

The power supply consists of a 208 volt ac primary, 2640 volt ac secondary transformer coupled to a saturable reactor with current monitoring circuitry, two overcurrent limits and a high voltage contactor.

It is designed to deliver 5 amperes at 0.1% (5 milliampere) regulation at 2400 volts ac. plus 10% (240 Volts ac). This means that when the circuit is closed 2640 volts ac is fed into the load. As the load saturates, the current increases and the voltage drops. At approximately ten seconds into operation the load is fully saturated and appears to be a direct short circuit. The current regulator, however, limits the current to 5 amperes at the maximum voltage point of 2400 volts ac. If the current regulator fails, an overcurrent breaker is set to trip a 6 amperes.

The system operates by monitoring output current, processing it in a direct current amplifier, and applying it to a direct current coil which controls the flux density in the core of the reactor. It is, essentially, a highly accurate magnetic amplifier.

Additionally, the power supply contains overcurrent protection for both the equipment and the load and an output contactor for closing the high voltage circuit to the Electric Chair. All connections to the power supply, except those for the 208 volts ac in, which are terminal block, are via two military type circular connectors.

The Control Console

The control console is a sloped metal panel cabinet containing the timing circuitry, switching circuitry and controls for the system operation. It contains two key switches for circuit control and a key controlled failsafe switch for high voltage output.

The timing sequence is accomplished with two solid state minute timers and one ten second timer cascaded from a system's timer of 130 seconds, guaranteeing system shutdown after 130 seconds even in the event of a sequential timer failure. Timer activation is all by precision relay.

One and two station control is standard and is facilitated by solid state circuitry. In single station control, one switch operates a solid state relay and activates the system. In two station control, two switches are utilized and the logic circuitry chooses the switch which will activate the relay. This insures that no one will know which operator controlled the circuit, as with a firing squad. The system does not retain the operating switch in memory.

The Electric Chair

The electric chair consists of an oaken chair with adjustable arms and backrest. It disassembles into five sub groups: the back, the seat, the arms, the electrode leg stock and the helmet.

The ankle electrodes, which are fabricated onto the leg stock, are turned of solid brass. They accomodate a #6 conductor and are paralleled to ground.

The helmet consists of an outer helmet of leather and an inner helmet of copper mesh and sponge. It will disassemble for repair and the electrode will accomodate a #6 conductor.

The chair design includes a drip pan and is fabricated to ensure easy disassembly for repair or storage. The straps are of nylon aircraft construction and consist of two ankle straps, two wrist straps and one cross-the-chest harness, all with quick release fasteners.

The entire system, because of its modular design, may be installed by non-technical people in several hours and is fully field repairable.

Specifications

Power Supply

Voltage: 208 vac in, 2400 vac plus 10% or 2640 vac out.

Current: 5 Amperes at 0.1% (5 milliamperes) regulation.

Overcurrent protection: 6 Amperes; 90 Amperes; load and equipment respectively.

Terminations: 2 MS (military type) circular connectors, console and high voltage output. Terminal block 208 vac input.

Control Console

Voltage: 110 vac.

Overcurrent protection: 1 ampere; 3 amperes.

Timing: Sequential--1 minute; 10 seconds; 1 minute. All solid state with a 130 second systems timer.

Switches: Three lock type--2 for circuit control operation, one for system failsafe; two operator switches.

Terminations: 1 MS (military type) circular connector.

Electric Chair

Material: Oak.

Electrodes: All turned of solid brass, two leg, one helmet.

Helmet: Leather, copper mesh and sponge.

Straps: Nylon, aircraft type; quick release.

This is a modular system and components are available separately. Integration into existing systems may require modification of component or system and interface.

The American Engineering Modular Electrocutation System

The design of an electrocutation system involves the consideration of a few, but very significant requirements. Voltage, current, connections, duration and number of current applications (jolts).

Requirements

First, the system should contain three electrodes. The head of the subject should be fitted with a tightly fitting cap containing an electrode with a saline solution moistened sponge. It is through this electrode that the current is introduced. Second, each ankle should be tightly fitted with an electrode, causing the current to divide and guaranteeing passage through the complete trunk of the subjects body. The two ankle electrodes are the return path of the current. Contact should be enhanced by using saline salve at the connections. It is of the utmost importance that good continuity, with a minimum amount of resistance, be maintained at the electrode contacts. Further, a minimum of 2000 volts ac must be maintained after voltage drop to guarantee permanent disruption of the functioning of the autonomic nervous system. Voltages lower than 2000 vac, at saturation, cannot guarantee heart death and are thus not adequate for electrocutation in that they may cause unnecessary trauma to the subject prior to death.

Medical Description

During electrocutation there are two factors that must be considered: the conscious and autonomic nervous systems. Voltages in excess of 1500 vac are generally sufficient to destroy the conscious nervous system, that which controls pain and understanding. Generally, unconsciousness occurs in 4.16 milliseconds, which is 1/240 part of a second. This is twenty-four time as fast as the subjects conscious nervous system can record pain. The autonomic nervous system is a little more difficult, however, and generally requires voltages in excess of 2000 volts ac to sieze the pacemaker in the subjects heart. Generally, we compute the voltage at 2000 volts ac plus 20%. After the voltage is applied and the subjects body saturates, the voltage has dropped about 10% (depending upon the resistance of the electrode contacts and that of the subjects body) and this should be taken into consideration, as well. Current should be kept under six amperes to minimize body damage (cooking).

Ideally, the voltage is calculated thus:

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Increase the voltage by 20% to accommodate subjects with greater resistance.

2000 vac plus 20% equals 2400 vac.

Increase voltage by 10% for drop at saturation.

2400 vac plus 10% equals 2640 vac.

Thus the voltage should be 2640 volts ac.

This 2640 vac should be applied in two jolts on one minute each, spaced at a ten second interval. On occasion the subjects heart will spasm, instead of seizing, during the first application of current and the application of the second jolt will generally eliminate this problem. This spasm is due to excessive chemical build-up (acetylcholine and sympathin) at the nerve junctions and the ten second wait generally allows for dissipation of the chemicals.

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The control system is designed for a timing sequence which will deliver two one minute jolts at 2400 volts ac spaced ten seconds apart. To guarantee failsafe operation a redundant system's timer activates and shuts down the system if any of the sequential timers fail. Additionally, there are two modes of operation: single station and two station. In single station, one push button switch controls the operation. In two station, two switches are utilized and logic circuitry determines which switch causes operation. The two station mode precludes the use of an executioner, since no one knows which of the two switches activated the system. The system does not retain the operating switch in memory. Further, since the controls are operated electronically, the operator handles only low voltage equipment, being completely isolated from the high voltage, guaranteeing operator safety.

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The Power Supply

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Power Supply

Voltage: 208 vac in, 2400 vac plus 10% or 2640 vac out.

Current: 5 Amperes at 0.1% (5 milliamperes) regulation.

Overcurrent protection: 6 Amperes; 90 Amperes; load and equipment respectively.

Terminations: 2 MS (military type) circular connectors, console and high voltage output. Terminal block 208 vac input.

Control Console

Voltage: 110 vac.

Overcurrent protection: 1 ampere; 3 amperes.

Timing: Sequential--1 minute; 10 seconds; 1 minute. All solid state with a 130 second systems timer.

Switches: Three lock type--2 for circuit control operation, one for system failsafe; two operator switches.

Terminations: 1 MS (military type) circular connector.

Electric Chair

Material: Oak.

Electrodes: All turned of solid brass, two leg, one helmet.

Helmet: Leather, copper mesh and sponge.

Straps: Nylon, aircraft type; quick release.

This is a modular system and components are available separately. Integration into existing systems may require modification of component or system and interface.

DISCLAIMER

American Engineering, Inc. assumes no responsibility for the intended or actual use of this device.

May 19, 1986

Boston MA

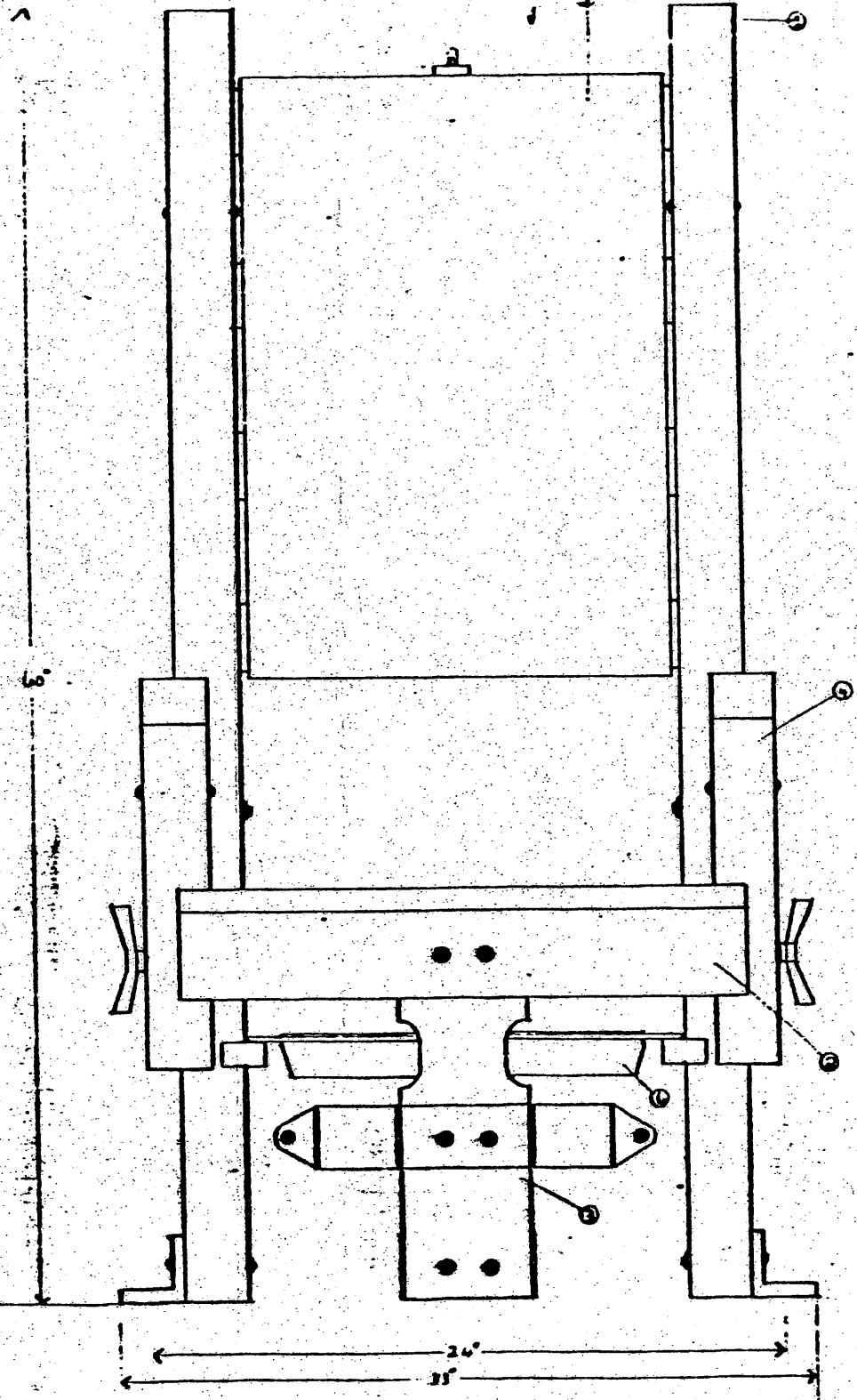
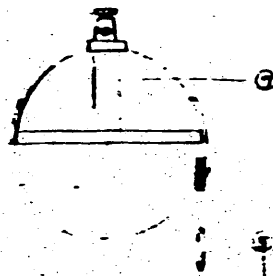
American Engineering, Inc.

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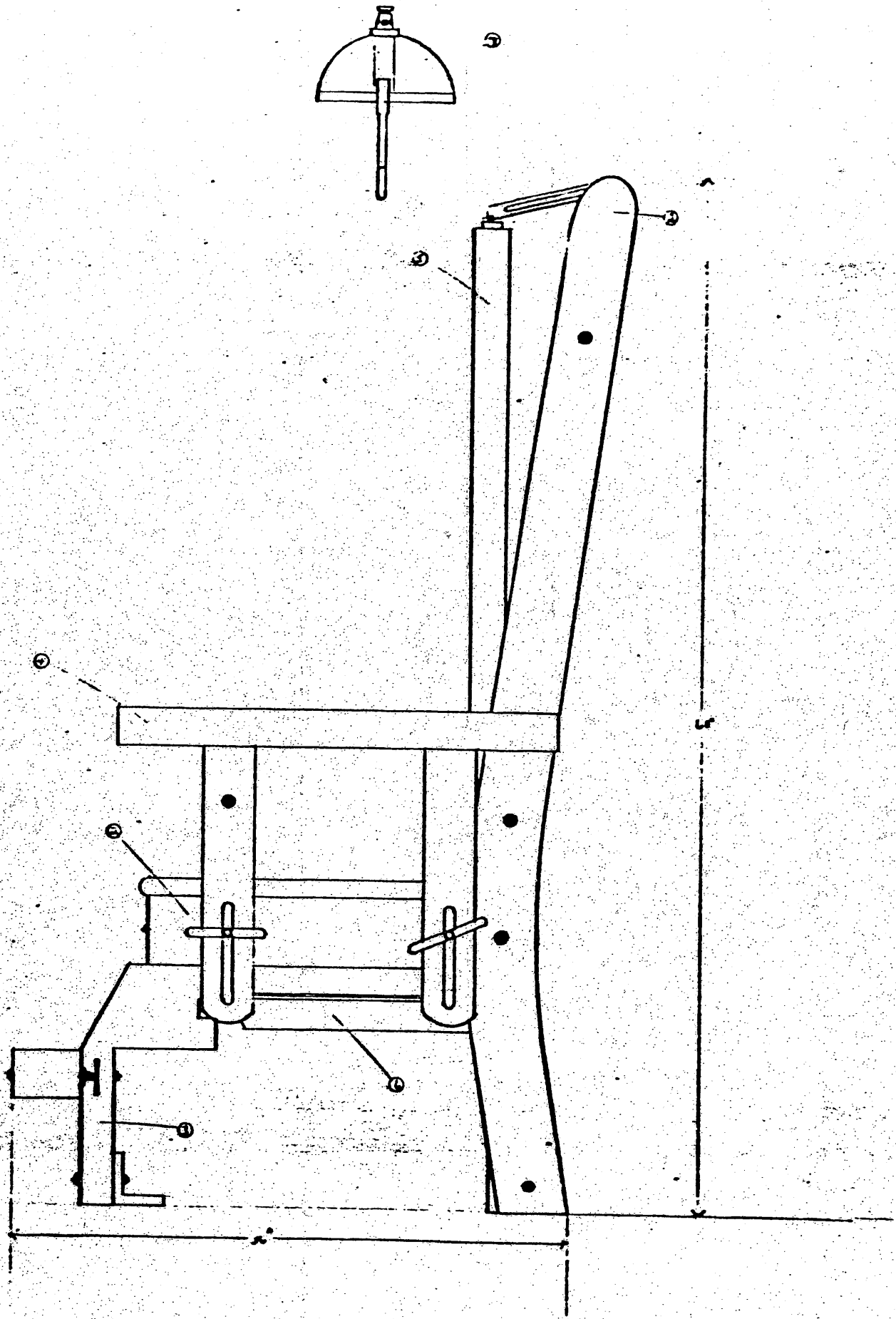


- Final
- 1- ASSEMBLY
 - 2- ASSEMBLY
 - 3- ASSEMBLY
 - 4- ASSEMBLY
 - 5- ASSEMBLY
 - 6- ASSEMBLY
 - 7- HELMET

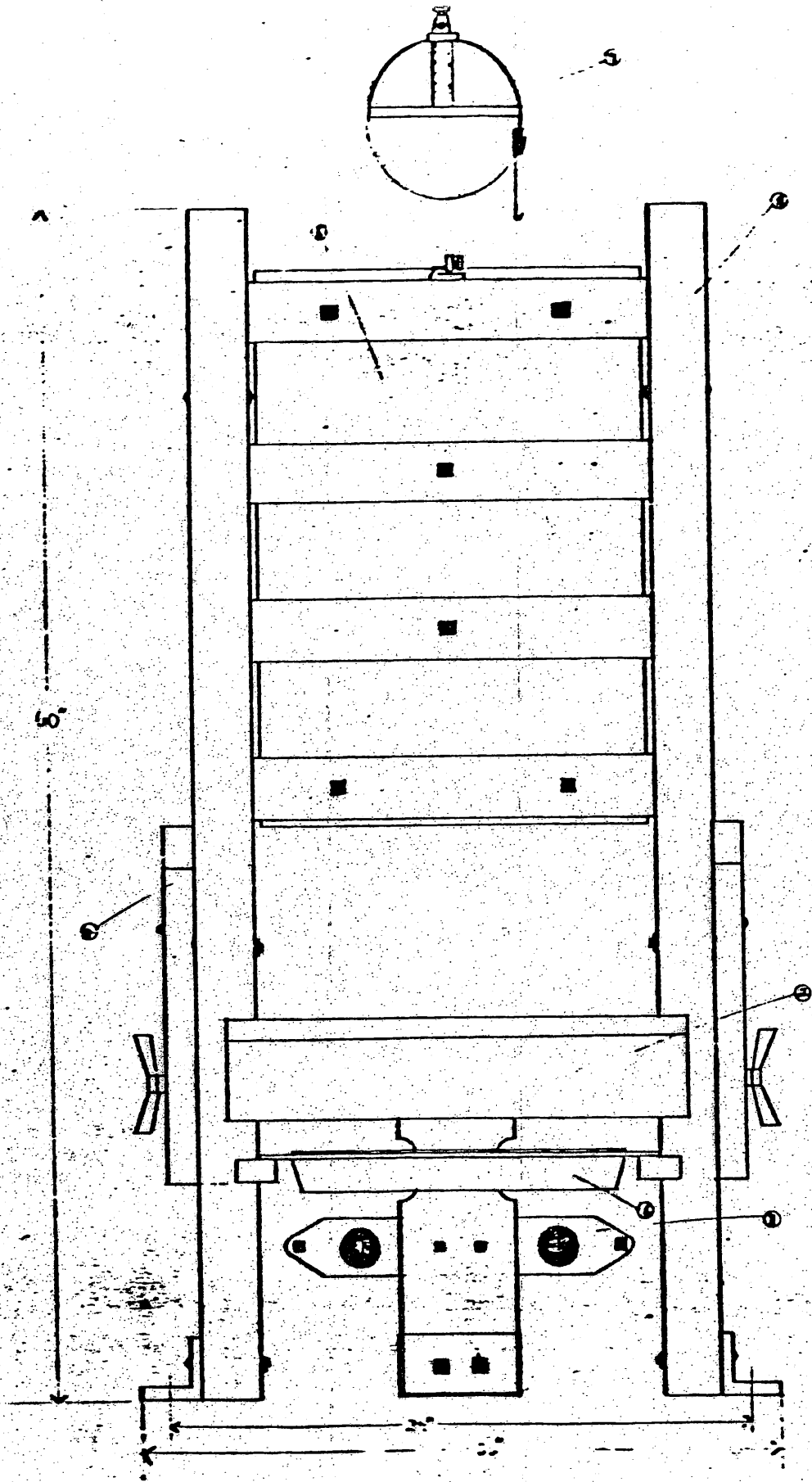
- VITA
- HEIGHT
 - WEIGHT
 - DEPTH
 - ARM
 - SEAT
 - SEAT
 - BACK
 - ELEC

Both

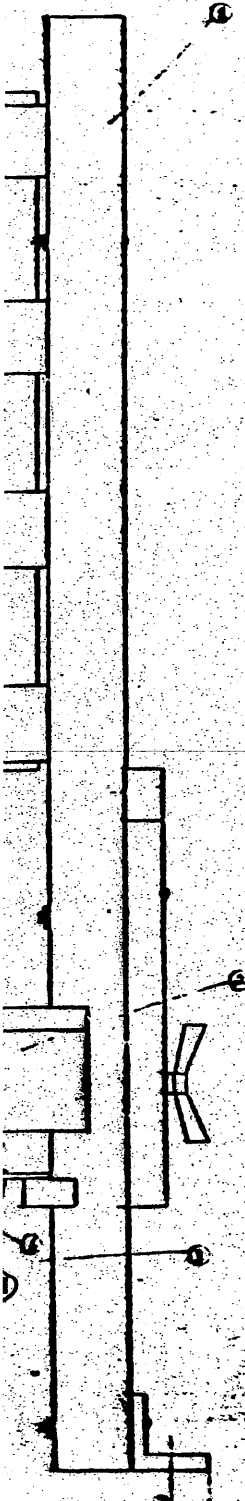
- STRAP
- 1- WAIST
 - 2- CHEST
 - 3- J. A.
 - 4- J. A.
 - STRAPS
 - ALL
 - STAYS



AMERICAN ENGINEERING



AMERICAN ENGINEERING



- FINAL FRAME ASSEMBLY
- 1-ASSEMBLY, AIR FRAME 5000-25
 - 2-ASSEMBLY, SEAT 5000-27
 - 3-ASSEMBLY, FRONT LEG 5000-24
 - 4-ASSEMBLY, ARM 5000-24
 - 5-ASSEMBLY, BACK REST 5000-26
 - 6-ASSEMBLY, DRIP PAN 5000-28
 - 7- HELMET

VITAL STATISTICS

- HEIGHT (OVERALL) 36"
- WIDTH (OVERALL) 33"
- DEPTH (OVERALL) 36"
- ARM ADJUSTMENT (FROM FLOOR) 22.5" TO 28.5"
- SEAT HEIGHT (FROM FLOOR) 31"
- SEAT WIDTH (USABLE) 24"
- SEAT DEPTH (USABLE) 17"
- BACK ADJUSTMENT - 30° TO VERTICAL

MATERIAL: DAK

ELECTRODES:

- 1/4" ANTI-STATIC
- 2" WIRE (1500V)
- 2" STRAP
- 2" HGL
- 2.5" CENTER DISTANCE FROM FLOOR

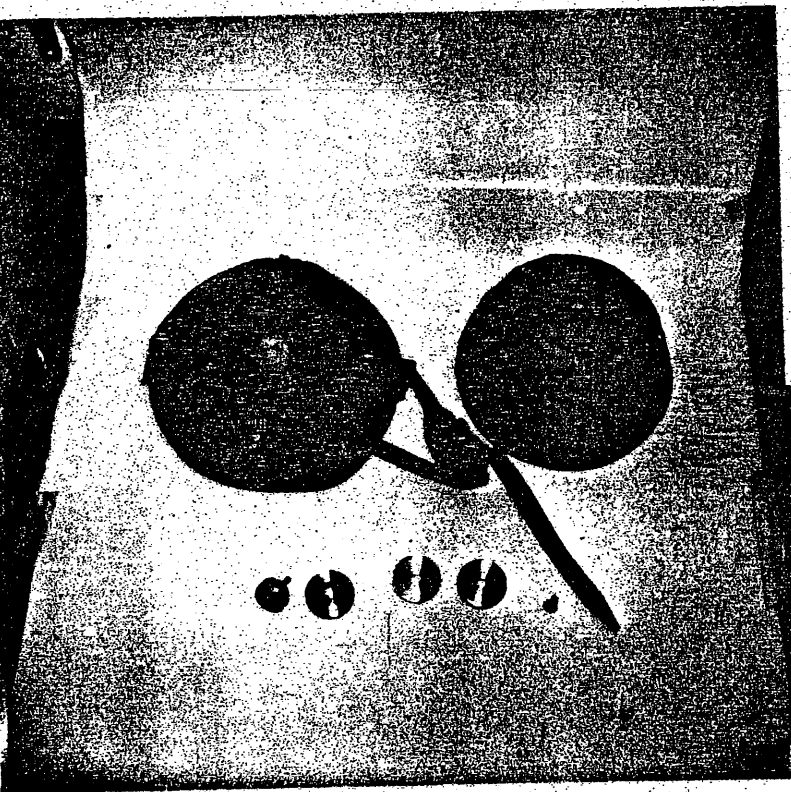
BOTH ANKLE ELECTRODES + HELMET ADJUSTER - #16 CONDUCTOR + FABRICATED OF S. 110 BRASS

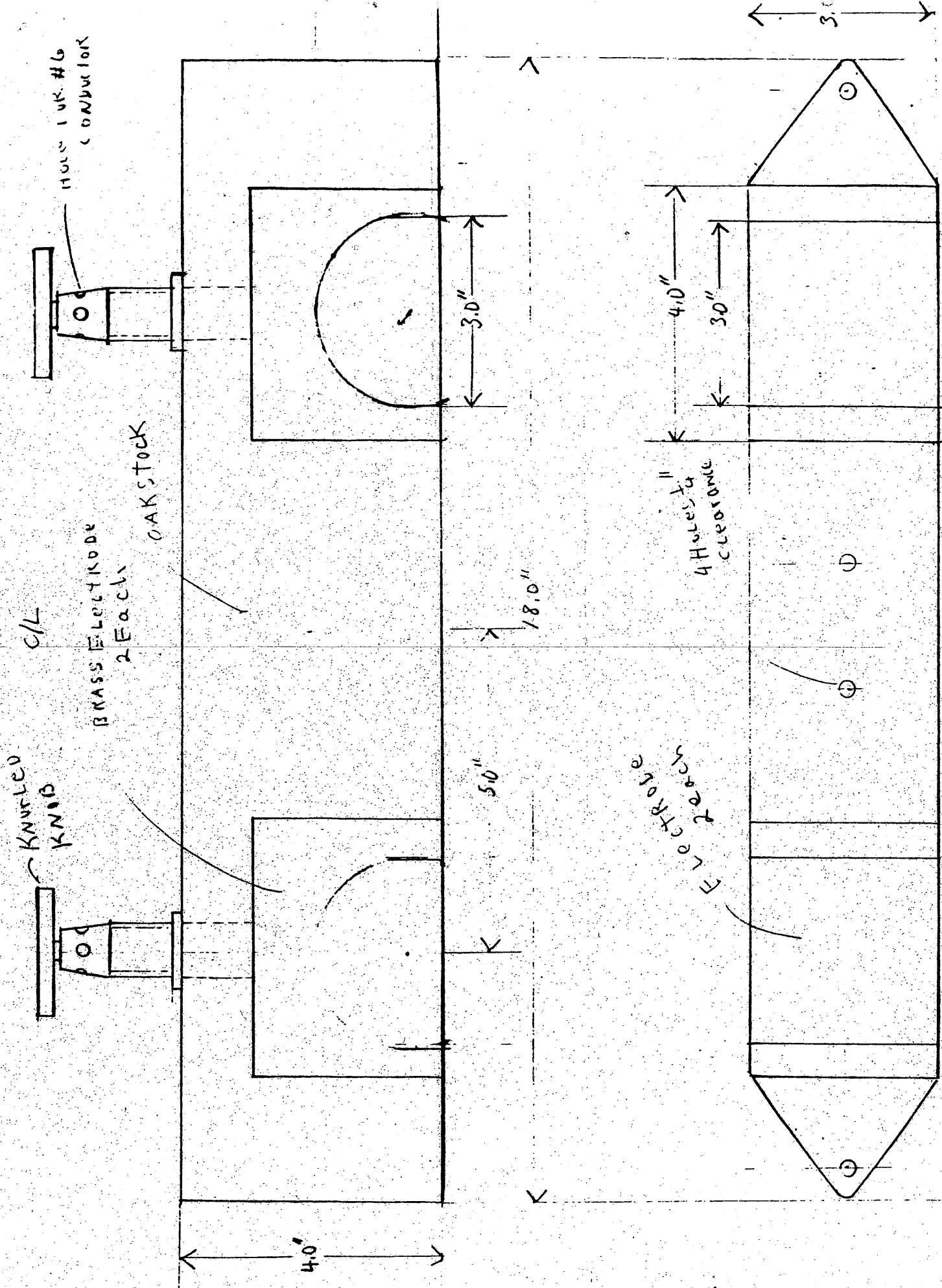
STRAPS (NOT SHOWN)

- 1. WAIST BELT
- 2. 2-CLASP STRAPS (FASTEN TO WAIST BUCKLE)
- 3. 2-ANKLE STRAPS
- 4. 2-ARM (WAIST) STRAPS
- STRAP ALL OF 2" NYLON WEBBING
- ALL BUCKLES QUICK RELEASE
- ALL ADJUSTERS NON-INTERFERENTIAL
- STRAPS STANDARD AIRCRAFT APPROVED TYPE

AMERICAN ENGINEERING

QTY	ITEM NO.	UNIT NO.	DESCRIPTION
			LIST OF
			FOR NO
			MECHANICAL
			ELECTRICAL
			NON-SPECIAL
			CONSTRUCTION
			MEASUREMENTS
			PHOTOGRAPHY
			APPROVED
			APPLICATION





LEG STOCK WITH ANKLE ELECTRODES. STRAPS NOT SHOWN - ONE EACH SIDE
 SC 1.0 11-20 11-17-52

American Engineering, Inc

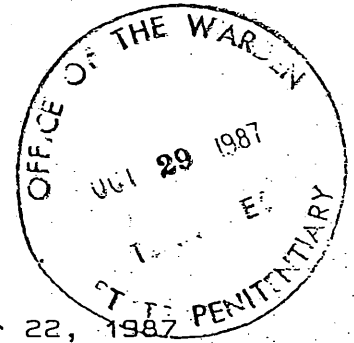
Consulting Engineers

108 Bunker Hill Street

Boston, Ma 02129

617-242-6006

7055



October 22, 1987

Mr. Mike Dutton, Warden
Tennessee State Penitentiary
Station A
Nashville, Tennessee 37219-5255

Dear Mike,

Pursuant to my discussion with Mr. Thomas Joplin earlier today, I am pleased to submit the enclosed material on our Modular Electrocutation System and Lethal Injection Machine.

QUOTATION

Complete Modular Electrocutation System	\$34,900.00
Complete Lethal Injection Machine	29,900.00
Legstocks for Electric Chair	2,600.00
Helmet for Electric Chair	1,800.00

All prices are F.O.B. Boston.

Delivery to be within 90 days from receipt of purchase order.

Quote is good for 90 days.

This proposal and all enclosed materials be come part of any purchase order.

American Engineering, Inc. assumes no liability for the actual or intended use of these devices.

American Engineering offers a Yearly Maintenance Program for all equipment.

American Engineering, Inc. holds both a Massachusetts medical license, as well as, a D.E.A. medical license (#MA0023236 and PA0240159, respectively) for medical research and can prescribe and supply all materials necessary for any execution.

American Engineering can evaluate your present system and make recommendations for correctional update. Further, it can configure your physical Death House area and construct or modify it as required.

All equipment can be installed by untrained maintenance personnel in a short time and is field repairable by these same personnel. American Engineering can install any equipment on site, if required, at a standard rate of:

Engineering \$85.00/Hr.

Technician 65.00/Hr.

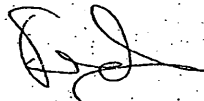
All expenses billed at a rate of cost plus 20%

American Engineering can test and certify your equipment prior to any execution. We offer an Execution Support Program whereby we set up and conduct the entire execution supplying everything but the executioners.

American Engineering has equipment in many states throughout the United States including hardware for electrocution, lethal injection, Gas chambers and gallows. American Engineering is available to consult at any time.

I will be in touch with you in the near future to discuss any specific problems or your current needs.

Very truly yours,
American Engineering, Inc.



Fred A. Leuchter, Jr.
Chief Engineer

Fred A. Leuchter, Associates
231 Kennedy Drive
Unit #110
Boston MA 02148
617-322-0104

August 26, 1988

Dept. of Correction
State of Tennessee
7115 Cockrill Bend Industrial Rd.
Nashville, Tennessee 37209

Dear Tom,

Pursuant to your request of earlier this month, I am pleased to submit the following quotation for your Electric Chair.

1. 1 ea. Electric Chair, complete except for helmet and leg stock electrode assembly. Chair will be fabricated of oak or similar hardwood and will be as per the enclosed Specification and drawings No.'s 5000-0-1, 2, and 3.

F.O.B. Boston \$7,990.00

2. 1 ea. Complete Electric Chair, including helmet and leg stock electrode assembly. Chair will be fabricated of oak or similar hardwood and will be as per the enclosed Specification and drawings No.'s 5000-0-1, 2, 3 and 1-LS.

F.O.B. Boston \$10,800.00

3. 1 ea. complete Modular Electrocution System as per the enclosed Specification and drawings No.'s 5000-01, 2, 3 and 1-LS.

F.O.B. Boston \$34,900.00

4. Shipping will be at prevailing rates at time of purchase order.

5. All hardware is guaranteed, unconditionally, for five years or five executions. Installation is guaranteed, unconditionally, for five years.

6. Installation and Test is available at the following rates:

Two (2) men, Two (2) days plus expenses billed at cost plus 20%.

Engineer 16 hours @ \$100.00	1,600.00
Technician 16 hours @ 85.00	1,360.00

Per diem:	
Engineer 4 days @ 200.00	800.00
Technician 4 days @ 100.00	400.00

Total labor	\$4,160.00
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Expenses:	
Airfare, food, lodging, car	\$2,320.00
plus 20%	464.00

Total expenses	\$2,784.00
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Total labor and expenses	\$6,944.00
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7. When a complete system is installed by Fred A. Leuchter Associates, a Ready For Use Certification is given.
8. When any complete piece of equipment is ordered, Certification is supplied for that piece.
9. The enclosed specification is herewith part of this quotation.
10. This quotation is good for ninety (90) days.
11. Delivery will be no later than ninety (90) days from the receipt of purchase order.
12. All engineering, fabrication and installation will be completed in a professional and competent manner.
13. This quotation is addendumed to any and all purchase orders.

14. Payment: A fifty percent (50%) down payment will be required at the time of issuance of purchase orders; twenty-five percent (25%) will be paid upon completion of work; and twenty-five percent (25%) will be paid thirty (30) days after final billing. All billing is net amount.

15. Fred A. Leuchter Associates assumes no liability for the intended or actual use of this device.

It is suggested that you purchase the complete electric chair in that you will receive a complete module with three new electrodes and the complete module may be Certified.

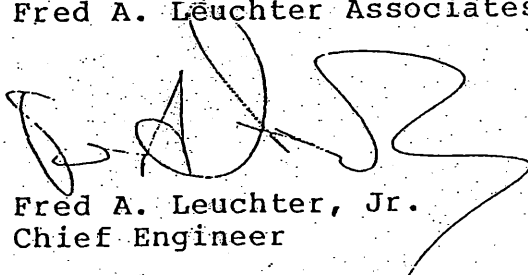
Fred A. Leuchter is also available, on a consulting basis, as necessary.

Fred A. Leuchter Associates can also enter into a training, maintenance and execution support program for your system, whereby, for a fixed fee it will hold a training seminar for your personnel and repair and replace any worn or defective parts in your system, as necessary, on a yearly basis. Additionally, on an as necessary basis, Fred A. Leuchter Associates will test and Certify your equipment and conduct your execution, under your direction, to ensure a trouble free and uneventful execution. Under this plan, Fred A. Leuchter Associates will assume full responsibility for the competency of the execution and conduct said execution in a dignified and professional manner.

I will await hearing from you on the above matter.

Boston, Massachusetts, August 26, 1988.

Very truly yours,
Fred A. Leuchter Associates



Fred A. Leuchter, Jr.
Chief Engineer

FAL/cal

Fred A. Leuchter, Associates
231 Kennedy Drive
Unit #110
Boston MA 02148
617-322-0104

THE FRED LEUCHTER ASSOCIATES MODULAR ELECTROCUTION SYSTEM

The design of an electrocution system involves the consideration of a few, but very significant, requirements. Voltage, current, connections, duration and number of current applications (jolts).

Requirements

First, the system should contain three (3) electrodes. The head should be fitted with a tightly fitting cap containing an electrode with a saline solution moistened sponge. It is through this electrode that the current is introduced. Second, each ankle should be tightly fitted with an electrode, causing the current to divide and guaranteeing passage through the complete trunk of the subjects body. Use of one (1) ankle electrode (instead of two [2]) will almost always ensure a longer and more difficult electrocution. These two (2) ankle electrodes are the return path of the current. Contact should be enhanced by using saline salve at each of the ankle connections. It is of the utmost importance that good circuit continuity, with a minimum amount of resistance, be maintained at the electrode contacts. Further, a minimum of 2000 volts ac must be maintained, after voltage drop, to guarantee permanent disruption of the functioning of the autonomic nervous system. Voltages lower than 2000 volts ac, at saturation, cannot guarantee heart death and are, thus, not adequate for electrocution, in that they may cause unnecessary trauma to the subject prior to death. Failure to adhere to these basic requirements could result in pain to the subject and failure to achieve heart death, leaving a brain dead subject in the chair.

Medical Description

During electrocution there are two (2) factors that must be considered: the conscious and the autonomic nervous systems. Voltages in excess of 1500 volts ac are generally sufficient to destroy the conscious nervous system, that which controls pain and understanding. Generally, unconsciousness occurs in 4.16 milliseconds, which is 1/240 part of a second. This is twenty-four (24) times as fast as the subjects conscious nervous system can record pain. The autonomic nervous system

is a little more difficult, however, and generally requires in excess of 2000 volts ac to seize the pacemaker in the subjects heart. Generally, we compute the voltage at 2000 volts ac plus 20%. After the voltage is applied and the subjects body saturates, the voltage has dropped about 10% (depending upon the resistance of the electrode contacts and that of the subject body) and this should be taken into consideration, as well. Current should be kept under six (6) amperes to minimize body damage (cooking).

Ideally, the voltage is calculated thus:

The average man weighing 70 kilos (154 lbs.) requires 2000 volts ac to seize the heart.

Increase the voltage by 20% to accommodate subjects with greater resistance.

2000 volts ac plus 20% equals 2400 volts ac.

Increase voltage by 10% for drop at saturation.

2400 volts ac plus 10% equals 2640 volts ac.

Thus the voltage should be 2640 volts ac.

This 2640 volts ac should be applied in two (2) jolts of one (1) minute each, spaced at a ten (10) second interval. On occasion, the subjects heart will spasm, instead of seizing, during the first application of current and the application of the second jolt will generally eliminate this problem. This spasm is due to excessive chemical build-up (acetylcholine and sympathin) at the nerve junctions and the ten (10) second wait generally allows for dissipation of the chemicals.

System Description

Fred Leuchter Associates manufactures a low-cost, state-of-the-art modular system for electrocution. The system utilizes solid state circuitry for control and timing, current regulation to five (5) milliamperes and single and two (2) station control for operation. It is designed with plug-in components for ease in repair and maintenance, and because of its modular design can be installed in very little time by untrained personnel.

The control system is designed for a timing sequence which will deliver two (2) one (1) minute jolts at 2400 volts ac spaced ten (10) seconds apart. To guarantee fail-safe operation, a redundant system's timer activates and shuts down the system if any of the sequential timers fail. Additionally, there are two (2) modes of operation: single station and two (2) station. In single station, one (1) push button switch controls the operation. In two (2) station, two (2) switches are utilized and logic circuitry determines which switch causes operation. The two (2) station mode precludes the use of an executioner, since no one knows which of the two (2) switches activated the system. The system does not retain the operating switch in memory. Further, since the controls are operated electronically, the operator handles only low voltage equipment, being completely isolated from the high voltage, guaranteeing operator safety.

The high voltage circuitry is designed to deliver 2640 volts ac upon activation and, as the load saturates and the current increases, the voltage stabilizes at 2400 volts ac. The current is limited to five (5) amperes, maximum, by a current regulator. The voltage, in accordance with the standard formula for admittance, will drop approximately 10% or 240 volts, but the current will never exceed five (5) amperes with 0.1% (five [5] milliamperes) regulation. A current limiting breaker protects the load in the event of a regulator failure and will open the circuit at six (6) amperes. The equipment is protected by a ninety (90) ampere overcurrent breaker.

The Power Supply

The power supply consists of a 208 volt ac primary, 2640 volt ac secondary transformer coupled to a saturable reactor with current monitoring circuitry, two (2) overcurrent limits and a high voltage contactor.

It is designed to deliver five (5) amperes at 0.1% (five [5] milliamperes) regulation at 2400 volts ac, plus 10% (240 volts ac). This means that when the circuit is closed, 2640 volts ac is fed into the load. As the load saturates, the current increases and the voltage drops. At approximately ten (10) seconds into operation, the load is fully saturated and appears to be a direct short circuit. The current regulator, however, limits the current to five (5) amperes at the maximum voltage point of 2400 volts ac. If the current regulator fails, an overcurrent breaker is set to trip at six (6) amperes.

The system operates by monitoring output current, processing it in a direct current amplifier, and applying it to a direct current coil which controls the flux density in the core of the reactor. It is, essentially, a highly accurate magnetic amplifier.

Additionally, the power supply contains overcurrent protection for both the equipment and the load and an output contactor for closing the high voltage circuit to the Electric Chair. All connections to the power supply, except those for the 208 volts ac in, which are terminal block, are via two (2) military-type circular connectors.

The Control Console

The control console is a sloped metal panel cabinet containing the timing circuitry, switching circuitry and controls for the system operation. It contains two (2) key switches for circuit control and a key-controlled fail-safe switch for high voltage output.

The timing sequence is accomplished with two (2) solid-state one (1) minute timers and one (1) ten (10) second timer cascaded from a system's timer of 130 seconds, guaranteeing system shutdown after 130 seconds even in the event of a sequential timer failure. Timer activation is all by precision relay.

One (1) and two (2) station control is standard and is facilitated by solid-state circuitry. In single station control, one (1) switch operates a solid-state relay and activates the system. In two (2) station control, two (2) switches are utilized and the logic circuitry chooses the switch which will activate the relay. This insures that no one will know which operator controlled the circuit, as with a firing squad. The system does not retain the operating switch in memory.

The Electric Chair

The electric chair consists of an oaken chair with adjustable arms and backrest. It disassembles into five (5) sub groups: the back, the seat, the arms, the electrode leg stock and the helmet.

The ankle electrodes, which are fabricated onto the leg stock, are turned of solid brass. They accommodate a #6 conductor and are paralleled to ground.

The helmet consists of an outer helmet of leather and an inner helmet of copper mesh and sponge. It will disassemble for repair and the electrode will accommodate a #6 conductor.

The chair design includes a drip pan and is fabricated to ensure easy disassembly for repair or storage. The straps are of nylon aircraft construction and consist of two (2) ankle straps, two (2) wrist straps and one (1) cross-the-chest harness, all with quick release fasteners.

The entire system, because of its modular design, may be installed by non-technical people in several hours and is fully field repairable.

SPECIFICATIONS

Power Supply

Voltage: 208 volts ac in, 2400 volts ac plus 10% or 2640 volts ac out.

Current: five (5) amperes at 0.1% (five [5] milliamperes) regulation.

Overcurrent protection: six (6) amperes; ninety (90) amperes; load and equipment respectively.

Terminations: two (2) MS (military-type) circular connectors, console and high voltage output. Terminal block, 208 volts ac input.

Control Console

Voltage: 110 volts ac.

Overcurrent protection: one (1) ampere; three (3) ampere.

Timing: sequential--one (1) minute; ten (10) seconds; one (1) minute. All solid-state with a 130 second system's timer.

Switches: three (3) lock type--two (2) for circuit control operation, one (1) for system fail-safe; two (2) operator switches.

Terminations: one (1) MS (military-type) circular connector.

Electric Chair

Material: oak.

Electrodes: all turned of solid brass, two (2) leg, one (1) helmet.

Helmet: leather, copper mesh and sponge.

Straps: nylon, aircraft-type; quick release.

This is a modular system and components are available separately. Integration into existing systems may require modification of component or system and interface.

DISCLAIMER

Fred Leuchter Associates assumes no liability for the intended or actual use of this device.

August 30, 1988
Boston, Massachusetts
Fred Leuchter Associates



DEPARTMENT OF CORRECTION
4TH FLOOR, RACHEL JACKSON BUILDING • NASHVILLE, TENNESSEE 37219

STEPHEN H. NORRIS
COMMISSIONER

MEMORANDUM

TO: William B. Whitson, Commissioner
Department of General Services

FROM: Stephen H. Norris

DATE: September 20, 1988

SUBJECT: Attached Requisition

The Department of Correction would like to ask your personal assistance with the attached requisition for an electrocution system. Department of Correction personnel have researched the market for suppliers of such systems and have been able to locate only the suggested system and vendor listed. The requested system will meet our needs, but we have no justification to ask for it on a proprietary basis other than it is the only certified system we can find on the market.

We would be willing to consider other systems and I would like to ask the assistance of your department in determining if there are any comparable systems on the market. If other systems are located, please request that the vendor submit detailed specifications and references so that Department of Correction personnel may review them to determine if they meet our needs. In the event there are no comparable systems, we request that the listed system be purchased on a proprietary basis.

Thank you for your assistance, and if you need more information, please contact me.

SHN:MD:md
Attachment

STATE OF TENNESSEE



REQUISITION FOR PURCHASE

To: Commissioner, Department of General Services

From: Correction
 Department: Budget Division - Fiscal Services
 Division: 320 6th Ave. N. - 3rd fl, R. Jackson Bldg
 Address: Nashville TN 37219-5252

Requisition Date: _____
 Allotment No.: _____
 Requisition No.: _____

F.O.B. - Middle Tennessee Maximum Security Facility
 Address: 7475 Cockrill Bend Industrial Rd.
Nashville TN 37209

Date Required: _____
 Contact Person: _____
 Telephone Number: _____
 Number of Invoices Req.: _____

Invoice
 To Address: Dept. of Correction - Budget Division
320 6th Ave. N., 3rd fl, R. Jackson Bldg.
Nashville TN 37219
 Attn: Fred Hix

- One-Time Purchase
- Departmental Contract:
- Agency Contract
- D.P.A. From Statewide
- D.P.A. From Bid

ITEM No.	TCC #:	Team #:	SWC #:	QTY.	UNIT	TOTAL ESTIMATED COST
	DESCRIPTION OF ARTICLES OR SERVICES					
				1	ea.	34,900.00
	<p>Modular Electrocutation System, Complete</p> <p>To include all components necessary to carry out State-ordered executions</p> <p><u>Specifications:</u></p> <p>POWER SUPPLY</p> <p>Voltage: 208 volts ac in, 2400 volts ac plus 10% or 2640 volts ac out.</p> <p>Current: five (5) amperes at 0.1% (five - 5 - milliamperes) regulation.</p> <p>Overcurrent protection: six (6) amperes; ninety (90) amperes; load and equipment respectively.</p> <p>Terminations: two (2) MS (military-type) circular connectors, console and high voltage output. Terminal block, 208 volts ac input.</p>					

APPROVED FOR FUNDS NOT TO EXCEED THE TOTAL ESTIMATED COST SHOWN HEREON:

NAME _____ TITLE _____

1 PURCHASING DIVISION

REQUISITION BY:

BATCH TYPE	BATCH DEPT.	BATCH NO.	SEQ NO.	TC	FD	COST CENTER	PROJECT/ SUB	GR/SUB	OBJ	AGY OBJ	REQ SFX	AMOUNT
											00	
											01	
											02	

CONTINUATION — REQUISITION FOR PURCHASE
STATE OF TENNESSEE
NASHVILLE

DATE _____
REQ. NO. _____
ALLOTMENT _____
SUB-HEAD _____

FROM DEPARTMENT OF _____ DIVISION OF _____

ITEM No.	QUANTITY	UNIT	DESCRIPTION OF ARTICLES OR SERVICES	TOTAL ESTIMATED COST	CONTRACT NUMBER
			<p>POWER SUPPLY (continued)</p> <p>The power supply consists of a 208 volt ac primary, 2640 volt as secondary transformer coupled to a saturable reactor with current monitoring circuitry, two (2) overcurrent limits and a high voltage contractor.</p> <p>It is designed to deliver five (5) amperes at 0.1% (five - 5 - milliamperes) regulation at 2400 volts ac, plus 10% (240 volts ac). This means that when the circuit is closed, 2640 volts ac is fed into the load. As the load saturates, the current increases and the voltage drops. At approximately ten (10) seconds into operation, the load is fully saturated and appears to be a direct short circuit. The current regulator, however, limits the current to five (5) amperes at the maximum voltage point of 2400 volts ac. If the current regulator fails, an overcurrent breaker is set to trip at six (6) amperes.</p> <p>The system operates by monitoring output current, processing it in a direct current amplifier, and applying it to a direct current coil which controls the flux density in the core of the reactor. It is, essentially, a highly accurate magnetic amplifier.</p> <p>Additionally, the power supply contains over-current protection for both the equipment and the load and an output contactor for closing the high voltage circuit to the Electric Chair. All connections to the power supply, except those for the 208 volts ac in, which are terminal block, are via two (2) military-type circular connectors.</p>		

REQUISITIONED BY:

1 PURCHASING AGENT

APPROVED FOR FUNDS NOT TO EXCEED THE TOTAL ESTIMATED COST SHOWN HEREON:

CONTINUATION — REQUISITION FOR PURCHASE

STATE OF TENNESSEE
NASHVILLE

DATE _____

REQ. NO. _____

ALLOTMENT _____

SUB-HEAD _____

FROM DEPARTMENT OF _____ DIVISION OF _____

ITEM No.	QUANTITY	UNIT	DESCRIPTION OF ARTICLES OR SERVICES	TOTAL ESTIMATED COST	CONTRACT NUMBER
			<p>CONTROL CONSOLE</p> <p>Voltage: 110 volts ac.</p> <p>Overcurrent protection: one (1) ampere; three (3) ampere.</p> <p>Timing: sequential--one (1) minute; ten (10) seconds; one (1) minute. All solid-state with a 130 second system's timer.</p> <p>Switches: three (3) lock type--two (2) for circuit control operation, one (1) for system fail-safe; two (2) operator switches.</p> <p>Terminations: one (1) MS (military-type) circular connector.</p> <p>The control console is a sloped metal panel cabinet containing the timing circuitry, switching circuitry and controls for the system operation. It contains two (2) key switches for circuit control and a key-controlled fail-safe switch for high voltage output.</p> <p>The timing sequence is accomplished with two (2) solid-state one (1) minute timers and one (1) ten (10) second timer cascaded from a system's timer of 130 seconds, guaranteeing system shutdown after 130 seconds even in the event of a sequential timer failure. Timer activation is all by precision relay.</p> <p>One station control is requested. In single station control, one switch operates a solid-state relay and activates the system.</p>		

REQUISITIONED BY:

APPROVED FOR FUNDS NOT TO EXCEED THE TOTAL ESTIMATED COST SHOWN HEREON:

CONTINUATION — REQUISITION FOR PURCHASE
STATE OF TENNESSEE
NASHVILLE

DATE _____

REQ. NO. _____

ALLOTMENT _____

SUB-HEAD _____

FROM DEPARTMENT OF _____ DIVISION OF _____

ITEM No.	QUANTITY	UNIT	DESCRIPTION OF ARTICLES OR SERVICES	TOTAL ESTIMATED COST	CONTRACT NUMBER
			<p>ELECTRIC CHAIR</p> <p>Material: oak.</p> <p>Electrodes: all turned of solid brass, two (2) leg, one (1) helmet.</p> <p>Helmet: leather, copper mesh and sponge.</p> <p>Straps: nylon, aircraft-type; quick release.</p> <p>The electric chair consists of an oaken chair with adjustable arms and backrest. It disassembles into five (5) sub groups: the back, the seat, the arms, the electrode leg stock and the helmet.</p> <p>The ankle electrodes, which are fabricated onto the leg stock, are turned of solid brass. They accommodate a #6 conductor and are paralleled to ground.</p> <p>The helmet consists of an outer helmet of leather and an inner helmet of copper mesh and sponge. It will disassemble for repair and the electrode will accommodate a #6 conductor.</p> <p>The chair design includes a drip pan and is fabricated to ensure easy disassembly for repair or storage. The straps are of nylon aircraft construction and consist of two (2) ankle straps, two (2) wrist straps and one (1) cross-the-chest harness, all with quick release fasteners.</p>		

REQUISITIONED BY:

APPROVED FOR FUNDS NOT TO EXCEED THE TOTAL ESTIMATED COST SHOWN HEREON:

1 PURCHASING AGENT

CONTINUATION — REQUISITION FOR PURCHASE
STATE OF TENNESSEE
NASHVILLE

DATE _____
REQ. NO. _____
ALLOTMENT _____
SUB-HEAD _____

FROM DEPARTMENT OF _____ DIVISION OF _____

ITEM No.	QUANTITY	UNIT	DESCRIPTION OF ARTICLES OR SERVICES	TOTAL ESTIMATED COST	CONTRACT NUMBER
			<p>INSTALLATION</p> <p>The State of Tennessee can provide installation if the successful vendor will certify the system as ready for use with State installation. If vendor will not certify the system as ready for use with installation performed by State of Tennessee personnel, then the vendor must provide installation.</p> <p>CERTIFICATION</p> <p>The successful vendor must furnish the State of Tennessee with a Ready For Use Certification once the system is installed.</p> <p>Suggested System:</p> <p>Fred A. Leuchter Modular Electrocutation System</p> <p>Suggested Vendor:</p> <p>Fred A. Leuchter, Associates 231 Kennedy Drive Unit #110 Boston, MA 02148</p>		

REQUISITIONED BY:

APPROVED FOR FUNDS NOT TO EXCEED THE TOTAL ESTIMATED COST SHOWN HEREON:

1 PURCHASING AGENT



Jed

DEPARTMENT OF CORRECTION
4TH FLOOR, RACHEL JACKSON BUILDING • NASHVILLE, TENNESSEE 37219

STEPHEN H. NORRIS
COMMISSIONER

October 4, 1988

Commissioner William B. Whitson
Department of General Services
C2-200 Central Services Building
Nashville, TN 37219-5201

Dear Commissioner Whitson:

The Department of Correction would like to ask your personal assistance with the attached requisition for an electrocution system. Department of Correction personnel have researched the market for suppliers of such systems and have been able to locate only the suggested system and vendor listed. The requested system will meet our needs, but we have no justification to ask for it on a proprietary basis other than it is the only certified system we can find on the market.

We would be willing to consider other systems, and I would like to ask the assistance of your department in determining if there are any comparable systems on the market. If other systems are located, please request that the vendor submit detailed specifications and references so that Department of Correction personnel may review them to determine if they meet our needs. In the event there are no comparable systems, we request that the listed system be purchased on a proprietary basis.

Thank you for your assistance, and if you need more information, please contact me.

Sincerely,

A handwritten signature in cursive script that reads "Stephen H. Norris".

Stephen H. Norris

SHN:MD:pc
Attachment

STATE OF TENNESSEE



REQUISITION FOR PURCHASE

To: Commissioner, Department of General Services

From: Correction
 Department: Budget Division - Fiscal Services
 Division: 320 6th Ave. N. - 3rd fl, R. Jackson Bldg
 Address: Nashville TN 37219-5252

Requisition Date: _____
 Allotment No.: _____
 Requisition No.: _____
 Date Required: _____
 Contact Person: _____
 Telephone Number: _____
 Number of Invoices Req.: _____

F.O.B. Middle Tennessee Maximum Security Facility
 Address: 7475 Cockrill Bend Industrial Rd.
Nashville TN 37209

Invoice: Dept. of Correction - Budget Division
 To Address: 320 6th Ave. N., 3rd fl, R. Jackson Bldg
Nashville TN 37219
 Attn: Fred Hix

- One-Time Purchase
- Departmental Contract
- Agency Contract
- D.P.A. From Statewide
- D.P.A. From Bid

ITEM No.	TCC #:	Team #:	SWC #:	QTY.	UNIT	TOTAL ESTIMATED COST						
DESCRIPTION OF ARTICLES OR SERVICES												
				1	ea.	34,900	00					
<p>Modular Electrocutation System, Complete</p> <p>To include all components necessary to carry out State-ordered executions</p> <p><u>Specifications:</u></p> <p>POWER SUPPLY</p> <p>Voltage: 208 volts ac in, 2400 volts ac plus 10% or 2640 volts ac out.</p> <p>Current: five (5) amperes at 0.1% (five - 5 - milliamperes) regulation.</p> <p>Overcurrent protection: six (6) amperes; ninety (90) amperes; load and equipment respectively.</p> <p>Terminations: two (2) MS (military-type) circular connectors, console and high voltage output. Terminal block, 208 volts ac input.</p>												
1 PURCHASING DIVISION		REQUISITION BY:		APPROVED FOR FUNDS NOT TO EXCEED THE TOTAL ESTIMATED COST SHOWN HEREON:								
BATCH TYPE	BATCH DEPT.	BATCH NO.	SEQ NO.	TC	FD	COST CENTER	PROJECT/SUB	GR/SUB	OBJ	AGY OBJ	REQ SFX	AMOUNT
											00	
											01	
											02	

CONTINUATION — REQUISITION FOR PURCHASE
STATE OF TENNESSEE
NASHVILLE

DATE _____
REQ. NO. _____
ALLOTMENT _____
SUB-HEAD _____

FROM DEPARTMENT OF _____ DIVISION OF _____

ITEM No.	QUANTITY	UNIT	DESCRIPTION OF ARTICLES OR SERVICES	TOTAL ESTIMATED COST	CONTRACT NUMBER
			<p>POWER SUPPLY (continued)</p> <p>The power supply consists of a 208 volt ac primary, 2640 volt as secondary transformer coupled to a saturable reactor with current monitoring circuitry, two (2) overcurrent limits and a high voltage contractor.</p> <p>It is designed to deliver five (5) amperes at 0.1% (five - 5 - milliamperes) regulation at 2400 volts ac, plus 10% (240 volts ac). This means that when the circuit is closed, 2640 volts ac is fed into the load. As the load saturates, the current increases and the voltage drops. At approximately ten (10) seconds into operation, the load is fully saturated and appears to be a direct short circuit. The current regulator, however, limits the current to five (5) amperes at the maximum voltage point of 2400 volts ac. If the current regulator fails, an overcurrent breaker is set to trip at six (6) amperes.</p> <p>The system operates by monitoring output current, processing it in a direct current amplifier, and applying it to a direct current coil which controls the flux density in the core of the reactor. It is, essentially, a highly accurate magnetic amplifier.</p> <p>Additionally, the power supply contains over-current protection for both the equipment and the load and an output contactor for closing the high voltage circuit to the Electric Chair. All connections to the power supply, except those for the 208 volts ac in, which are terminal block, are via two (2) military-type circular connectors.</p>		

REQUISITIONED BY: _____

APPROVED FOR FUNDS NOT TO EXCEED THE TOTAL ESTIMATED COST SHOWN HEREON: _____

CONTINUATION — REQUISITION FOR PURCHASE
STATE OF TENNESSEE
NASHVILLE

DATE _____
REQ. NO. _____
ALLOTMENT _____
SUB-HEAD _____

FROM DEPARTMENT OF _____ DIVISION OF _____

ITEM No.	QUANTITY	UNIT	DESCRIPTION OF ARTICLES OR SERVICES	TOTAL ESTIMATED COST	CONTRACT NUMBER
			<p>ELECTRIC CHAIR</p> <p>Material: oak.</p> <p>Electrodes: all turned of solid brass, two (2) leg, one (1) helmet.</p> <p>Helmet: leather, copper mesh and sponge.</p> <p>Straps: nylon, aircraft-type; quick release.</p> <p>The electric chair consists of an oaken chair with adjustable arms and backrest. It disassembles into five (5) sub groups: the back, the seat, the arms, the electrode leg stock and the helmet.</p> <p>The ankle electrodes, which are fabricated onto the leg stock, are turned of solid brass. They accommodate a #6 conductor and are paralleled to ground.</p> <p>The helmet consists of an outer helmet of leather and an inner helmet of copper mesh and sponge. It will disassemble for repair and the electrode will accommodate a #6 conductor.</p> <p>The chair design includes a drip pan and is fabricated to ensure easy disassembly for repair or storage. The straps are of nylon aircraft construction and consist of two (2) ankle straps, two (2) wrist straps and one (1) cross-the-chest harness, all with quick release fasteners.</p>		

1 PURCHASING AGENT

REQUISITIONED BY: _____

APPROVED FOR FUNDS NOT TO EXCEED THE TOTAL ESTIMATED COST SHOWN HEREON:

NAME _____ TITLE _____

CONTINUATION — REQUISITION FOR PURCHASE

STATE OF TENNESSEE
NASHVILLE

DATE _____
REQ. NO. _____
ALLOTMENT _____
SUB-HEAD _____

FROM DEPARTMENT OF _____ DIVISION OF _____

ITEM No.	QUANTITY	UNIT	DESCRIPTION OF ARTICLES OR SERVICES	TOTAL ESTIMATED COST	CONTRACT NUMBER
			<p>CONTROL CONSOLE</p> <p>Voltage: 110 volts ac.</p> <p>Overcurrent protection: one (1) ampere; three (3) ampere.</p> <p>Timing: sequential--one (1) minute; ten (10) seconds; one (1) minute. All solid-state with a 130 second system's timer.</p> <p>Switches: three (3) lock type--two (2) for circuit control operation, one (1) for system fail-safe; two (2) operator switches.</p> <p>Terminations: one (1) MS (military-type) circular connector.</p> <p>The control console is a sloped metal panel cabinet containing the timing circuitry, switching circuitry and controls for the system operation. It contains two (2) key switches for circuit control and a key-controlled fail-safe switch for high voltage output.</p> <p>The timing sequence is accomplished with two (2) solid-state one (1) minute timers and one (1) ten (10) second timer cascaded from a system's timer of 130 seconds, guaranteeing system shutdown after 130 seconds even in the event of a sequential timer failure. Timer activation is all by precision relay.</p> <p>One station control is requested. In single station control, one switch operates a solid-state relay and activates the system.</p>		

1 PURCHASING AGENT

REQUISITIONED BY: _____

APPROVED FOR FUNDS NOT TO EXCEED THE TOTAL ESTIMATED COST SHOWN HEREON: _____

CONTINUATION — REQUISITION FOR PURCHASE

STATE OF TENNESSEE
NASHVILLE

DATE _____
REQ. NO. _____
ALLOTMENT _____
SUB-HEAD _____

FROM DEPARTMENT OF _____ DIVISION OF _____

ITEM No.	QUANTITY	UNIT	DESCRIPTION OF ARTICLES OR SERVICES	TOTAL ESTIMATED COST	CONTRACT NUMBER
			<p>INSTALLATION</p> <p>The State of Tennessee can provide installation if the successful vendor will certify the system as ready for use with State installation. If vendor will not certify the system as ready for use with installation performed by State of Tennessee personnel, then the vendor must provide installation.</p> <p>CERTIFICATION</p> <p>The successful vendor must furnish the State of Tennessee with a Ready For Use Certification once the system is installed.</p> <p>Suggested System:</p> <p>Fred A. Leuchter Modular Electrocution System</p> <p>Suggested Vendor:</p> <p>Fred A. Leuchter, Associates 231 Kennedy Drive Unit #110 Boston, MA 02148</p>		

REQUISITIONED BY:

APPROVED FOR FUNDS NOT TO EXCEED THE TOTAL ESTIMATED COST SHOWN HEREON:

1 PURCHASING AGENT

Fred A. Leuchter, Associates
231 Kennedy Drive
Unit #110
Boston MA 02148
617-322-0104

NOV 01 1988

Mr. Michael Dutton, Warden
Transition Team
Tennessee Department of Correction
7115 Cockrill Bend Industrial Road
Nashville, Tennessee 37209

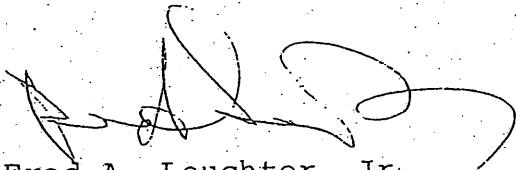
November 1, 1988

Dear Warden Dutton,

Enclosed please find a copy of the report on the electric chair with my recommendations for a new system at your new facility.

If you have any questions, please do not hesitate to call.

Very truly yours.
Fred A. Leuchter Associates



Fred A. Leuchter, Jr.
Chief Engineer

FAL/cal

Fred A. Leuchter, Associates
231 Kennedy Drive
Unit #110
Boston MA 02148
617-322-0104

THE FRED LEUCHTER ASSOCIATES MODULAR ELECTROCUTION SYSTEM

The design of an electrocution system involves the consideration of a few, but very significant, requirements. Voltage, current, connections, duration and number of current applications (jolts).

Requirements

First, the system should contain three (3) electrodes. The head should be fitted with a tightly fitting cap containing an electrode with a saline solution moistened sponge. It is through this electrode that the current is introduced. Second, each ankle should be tightly fitted with an electrode, causing the current to divide and guaranteeing passage through the complete trunk of the subjects body. Use of one (1) ankle electrode (instead of two [2]) will almost always ensure a longer and more difficult electrocution. These two (2) ankle electrodes are the return path of the current. Contact should be enhanced by using saline salve at each of the ankle connections. It is of the utmost importance that good circuit continuity, with a minimum amount of resistance, be maintained at the electrode contacts. Further, a minimum of 2000 volts ac must be maintained, after voltage drop, to guarantee permanent disruption of the functioning of the autonomic nervous system. Voltages lower than 2000 volts ac, at saturation, cannot guarantee heart death and are, thus, not adequate for electrocution, in that they may cause unnecessary trauma to the subject prior to death. Failure to adhere to these basic requirements could result in pain to the subject and failure to achieve heart death, leaving a brain dead subject in the chair.

Medical Description

During electrocution there are two (2) factors that must be considered: the conscious and the autonomic nervous systems. Voltages in excess of 1500 volts ac are generally sufficient to destroy the conscious nervous system, that which controls pain and understanding. Generally, unconsciousness occurs in 4.16 milliseconds, which is 1/240 part of a second. This is twenty-four (24) times as fast as the subjects conscious nervous system can record pain. The autonomic nervous system

is a little more difficult, however, and generally requires in excess of 2000 volts ac to seize the pacemaker in the subjects heart. Generally, we compute the voltage at 2000 volts ac plus 20%. After the voltage is applied and the subjects body saturates, the voltage has dropped about 10% (depending upon the resistance of the electrode contacts and that of the subject body) and this should be taken into consideration, as well. Current should be kept under six (6) amperes to minimize body damage (cooking).

Ideally, the voltage is calculated thus:

The average man weighing 70 kilos (154 lbs.) requires 2000 volts ac to seize the heart.

Increase the voltage by 20% to accommodate subjects with greater resistance.

2000 volts ac plus 20% equals 2400 volts ac.

Increase voltage by 10% for drop at saturation.

2400 volts ac plus 10% equals 2640 volts ac.

Thus the voltage should be 2640 volts ac.

This 2640 volts ac should be applied in two (2) jolts of one (1) minute each, spaced at a ten (10) second interval. On occasion, the subjects heart will spasm, instead of seizing, during the first application of current and the application of the second jolt will generally eliminate this problem. This spasm is due to excessive chemical build-up (acetylcholine and sympathin) at the nerve junctions and the ten (10) second wait generally allows for dissipation of the chemicals.

System Description

Fred Leuchter Associates manufactures a low-cost, state-of-the-art modular system for electrocution. The system utilizes solid state circuitry for control and timing, current regulation to five (5) milliamperes and single and two (2) station control for operation. It is designed with plug-in components for ease in repair and maintenance, and because of its modular design can be installed in very little time by untrained personnel.

The control system is designed for a timing sequence which will deliver two (2) one (1) minute jolts at 2400 volts ac spaced ten (10) seconds apart. To guarantee fail-safe operation, a redundant system's timer activates and shuts down the system if any of the sequential timers fail. Additionally, there are two (2) modes of operation: single station and two (2) station. In single station, one (1) push button switch controls the operation. In two (2) station, two (2) switches are utilized and logic circuitry determines which switch causes operation. The two (2) station mode precludes the use of an executioner, since no one knows which of the two (2) switches activated the system. The system does not retain the operating switch in memory. Further, since the controls are operated electronically, the operator handles only low voltage equipment, being completely isolated from the high voltage, guaranteeing operator safety.

The high voltage circuitry is designed to deliver 2640 volts ac upon activation and, as the load saturates and the current increases, the voltage stabilizes at 2400 volts ac. The current is limited to five (5) amperes, maximum, by a current regulator. The voltage, in accordance with the standard formula for admittance, will drop approximately 10% or 240 volts, but the current will never exceed five (5) amperes with 0.1% (five [5] milliamperes) regulation. A current limiting breaker protects the load in the event of a regulator failure and will open the circuit at six (6) amperes. The equipment is protected by a ninety (90) ampere overcurrent breaker.

The Power Supply

The power supply consists of a 208 volt ac primary, 2640 volt ac secondary transformer coupled to a saturable reactor with current monitoring circuitry, two (2) overcurrent limits and a high voltage contactor.

It is designed to deliver five (5) amperes at 0.1% (five [5] milliamperes) regulation at 2400 volts ac, plus 10% (240 volts ac). This means that when the circuit is closed, 2640 volts ac is fed into the load. As the load saturates, the current increases and the voltage drops. At approximately ten (10) seconds into operation, the load is fully saturated and appears to be a direct short circuit. The current regulator, however, limits the current to five (5) amperes at the maximum voltage point of 2400 volts ac. If the current regulator fails, an overcurrent breaker is set to trip at six (6) amperes.

The system operates by monitoring output current, processing it in a direct current amplifier, and applying it to a direct current coil which controls the flux density in the core of the reactor. It is, essentially, a highly accurate magnetic amplifier.

Additionally, the power supply contains overcurrent protection for both the equipment and the load and an output contactor for closing the high voltage circuit to the Electric Chair. All connections to the power supply, except those for the 208 volts ac in, which are terminal block, are via two (2) military-type circular connectors.

The Control Console

The control console is a sloped metal panel cabinet containing the timing circuitry, switching circuitry and controls for the system operation. It contains two (2) key switches for circuit control and a key-controlled fail-safe switch for high voltage output.

The timing sequence is accomplished with two (2) solid-state one (1) minute timers and one (1) ten (10) second timer cascaded from a system's timer of 130 seconds, guaranteeing system shutdown after 130 seconds even in the event of a sequential timer failure. Timer activation is all by precision relay.

One (1) and two (2) station control is standard and is facilitated by solid-state circuitry. In single station control, one (1) switch operates a solid-state relay and activates the system. In two (2) station control, two (2) switches are utilized and the logic circuitry chooses the switch which will activate the relay. This insures that no one will know which operator controlled the circuit, as with a firing squad. The system does not retain the operating switch in memory.

The Electric Chair

The electric chair consists of an oaken chair with adjustable arms and backrest. It disassembles into five (5) sub groups: the back, the seat, the arms, the electrode leg stock and the helmet.

The ankle electrodes, which are fabricated onto the leg stock, are turned of solid brass. They accommodate a #6 conductor and are paralleled to ground.

The helmet consists of an outer helmet of leather and an inner helmet of copper mesh and sponge. It will disassemble for repair and the electrode will accommodate a #6 conductor.

The chair design includes a drip pan and is fabricated to ensure easy disassembly for repair or storage. The straps are of nylon aircraft construction and consist of two (2) ankle straps, two (2) wrist straps and one (1) cross-the-chest harness, all with quick release fasteners.

The entire system, because of its modular design, may be installed by non-technical people in several hours and is fully field repairable.

SPECIFICATIONS

Power Supply

Voltage: 208 volts ac in, 2400 volts ac plus 10% or 2640 volts ac out.

Current: five (5) amperes at 0.1% (five [5] milliamperes) regulation.

Overcurrent protection: six (6) amperes; ninety (90) amperes; load and equipment respectively.

Terminations: two (2) MS (military-type) circular connectors, console and high voltage output. Terminal block, 208 volts ac input.

Control Console

Voltage: 110 volts ac.

Overcurrent protection: one (1) ampere; three (3) ampere.

Timing: sequential--one (1) minute; ten (10) seconds; one (1) minute. All solid-state with a 130 second system's timer.

Switches: three (3) lock type--two (2) for circuit control operation, one (1) for system fail-safe; two (2) operator switches.

Terminations: one (1) MS (military-type) circular connector.

Electric Chair

Material: oak.

Electrodes: all turned of solid brass, two (2) leg, one (1) helmet.

Helmet: leather, copper mesh and sponge.

Straps: nylon, aircraft-type; quick release.

This is a modular system and components are available separately. Integration into existing systems may require modification of component or system and interface.

DISCLAIMER

Fred Leuchter Associates assumes no liability for the intended or actual use of this device.

August 30, 1988
Boston, Massachusetts
Fred Leuchter Associates

DATE: 07/01/89	ALLOT. No.: 329.01	REQN. No.: 3263 P	OBJ. CODE: 076	CONT. REF.:	Cost Center: 151
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SHIP TO: ON OR BEFORE: BILL TO: SEND COPIES OF INVOICES

DEPARTMENT: CORRECTION
 DIVISION: RIVERBEND MAX. SEC. INSTI.
 ADDRESS: 7475 COCKRILL BEND ROAD
 NASHVILLE, TN 37209

PROCESSED

JUL 1 1989

DIRECTOR OF ACCOUNTS

102-23 (01) AGENCY DELEGATED PURCHASE AUTHORITY FROM BID

1. SCOPE: This Agency Delegated Purchase Authority from Bid is authorized under the provisions of TCA 12-3-806 to purchase the product or service listed below, in accordance with TCA 12-3-210. Items now listed or subsequently listed on statewide contract shall not be purchased under this authority.

2. PROCEDURES FOR THIS CONTRACT: Purchases under this authority shall be made in accordance with the provisions of Title 12, Chapter 3, Tennessee Code Annotated and the rules promulgated pursuant thereto, Rules of the Department of General Services, Purchasing Division. The Agency shall request bids from bidders who are registered as required by TCA 12-3-701 and listed on the Commodity Bid List furnished by the Central Purchasing Division. Local suppliers should be encouraged to register with Central Purchasing. Preference in the solicitation of bids shall be given to qualified small business bidders as required by TCA 12-3-804. The Agency is required to solicit bids in accordance with the bidding policy under the procedures of the Department of General Services Purchasing Division, Section 12.1. These procedures require sealed bids be taken on all purchases of more than \$2,000.00. This sealed bid procedure requires three (3) invitations to bid be sent to prospective vendors for purchases of up to \$2,000.00, and one additional invitation per \$250.00 for purchases over \$2,000.00, with a maximum issuance requirement of fifteen (15) invitations. The informal or telephone procedure may be utilized on purchases not exceeding \$2,000.00 and requires a minimum of three (3) competitive bids, whenever possible. The Agency shall prepare a Departmental Purchase Order P-4 and Bid Abstract P-5. The CPO authorized bid block shall be checked and the number of this purchase order shall be listed in the reference block of the P-4, and each item shall be listed separately showing item number, description and price. Enter the Buying Team Number in the lower center block. Forward the No. 1 copy directly to the successful bidder.

3. PRODUCT OR SERVICE: Purchases are restricted to REPAIR AND MOVING OF ELECTRICAL EQUIPMENT.

4. TERM: The term of this contract shall begin with the date of this Purchase Order and end JUNE 30, 1990.

5. VOLUME: Estimated Purchases: FY 1989-90 \$ 40,000.00

6. CONTRACT ADMINISTRATOR - STATE: Name: BEN BERNETT Phone: (615) 741-6674

PURCHASE ORDER NO. X 20579	RECEIVED BUYING TEAM: 01 JUL 28 1989	APPROVED: GEORGE STREET
		DIRECTOR OF PURCHASING
CHECKING FILE		BY: _____

1

DEPARTMENT OF GENERAL SERVICES

File
[Signature]

Fred A. Leuchter Associates, Inc.
Consulting Engineers
231 Kennedy Dr. Unit 110
Boston, MA 02148

(617) 322-0104

FAX (617) 321-3306

November 2, 1989

Mr. Michael Dutton
Warden
Riverbend Maximum Security Institution
Dept. of Correction
7475 Cockrill Bend Industrial Rd.
Nashville, Tennessee 37209

Dear Warden Dutton,

Pursuant to our conversation of earlier today, I am pleased to submit the following quotation for your Modular Power Supply Test Unit for your new Electrocution System.

1. 1 ea. Modular Power Supply Test Unit for your Electrocution System. This unit has been especially engineered for the Fred A. Leuchter Modular Power Supply and your system. It contains an especially fabricated, harmonically balanced, twenty (20) component, high wattage resistor package which is cooled by a quadrafan assembly having an area of some 255 square inches and an aggregate airflow of 2320 cfm. When testing the Electrocution System it replaces the electric chair and the executee. It mates with the power cable of the Electric Chair.

F.O.B. Boston

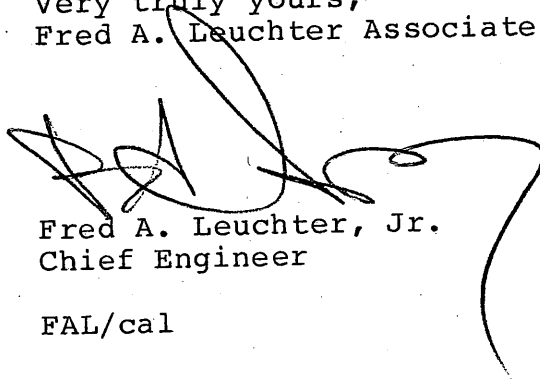
\$5,900.00

2. Shipping will be at prevailing rates at time of purchase order.
3. All hardware is guaranteed, unconditionally, for five years or five executions.
4. On completion of the installation of the Electrocution System, the Fred A. Leuchter Associates, Inc. **Ready For Use Certificate** will include the Test Unit.

5. This Test Unit will be used to test the new Modular Electrocution System at the Riverbend Maximum Security Institution.
6. This quotation is good for ninety (90) days.
7. Delivery will be by November 27, 1989; or no later than ninety (90) days from the receipt of purchase order; or sooner, if the need arises.
8. All engineering, fabrication and installation will be completed in a professional and competent manner.
9. This quotation is addendumed to any and all purchase orders.
10. Payment: A fifty percent (50%) down payment will be required at the time of issuance of purchase orders; twenty-five percent (25%) will be paid upon completion of work; and twenty-five percent (25%) will be paid thirty (30) days after final billing. All billing is net amount.
11. Fred A. Leuchter Associates assumes no liability for the intended or actual use of this device.

I will await hearing from you on the above matter.

Very truly yours,
Fred A. Leuchter Associates



Fred A. Leuchter, Jr.
Chief Engineer

FAL/cal

State of Tennessee



Department of Correction
Division of Adult Institutions

Riverbend Maximum Security Institution
7475 Cockrell Bend Industrial Road
Nashville, Tennessee 37209-1048
615-741-7876

Fred A. Leuchter Assoc., Inc.
231 Kennedy Dr.,
Unit 110
Boston, Mass 02148

Dear Sir

Please accept our attached order for one Modular Power Supply Test Unit. We have increased our DPA Contract to cover the cost of this unit. Thank you for your assistance.

Sincerely,

Procurement Officer

Post-It™ brand fax transmittal memo 7671 # of pages ▶ 2

To	From <i>RMSI</i>
Co. <i>Fred Leuchter</i>	Co.
Dept.	Phone # <i>615-741-7876</i>
Fax # <i>617-321-3306</i>	Fax # <i>615-741-4521</i>

PURCHASE ORDER NO.

520021

8-99 ALLOT. NO. COST CTR. OBJ. CODE(S) I-20579
 11.329.42 21 161

SHIP ON OR BEFORE

BILL TO: Business Office

SEND

COPIES OF INVOICE

ITEMENT Correction
 IN Riverbend Maximum Security Institution
 SS 7475 Cockrill Bend Industrial Road
 Nashville TN 37209

F.O.B. DESTINATION	<input checked="" type="checkbox"/>
PREPAY AND ADD FRT.	<input type="checkbox"/>
CASH DISCOUNT	

ITION

Fred A. Leuchter Assoc., Inc.
 231 Kennedy Dr.
 Unit 110
 Boston, Mass 02148

D.P.O. CONTRACT	
C.P.O. CONTRACT	<input checked="" type="checkbox"/>
C.P.O. AUTHORIZED BID	
C.P.O. LOCAL	
C.P.O. EMERGENCY	

VENDOR I.D. NO. #

ITEM NUMBER	QTY.	UNIT	DESCRIPTION TCC CODE	BRAND OR GRADE	UNIT PRICE	AMOUNT
	1	EA	Modular Power Supply Test Unit For Electrocuton System			5,900.00

TOTAL → 5,900.00

DEPARTMENTAL	FISCAL OFFICER	APPROVED BY:
520021		DIVISION
NUMERIC OFFICE OF ORIGIN	COMMISSIONER OF DEPARTMENT	TITLE

BATCH TYPE	BATCH DATE	BATCH DEPT.	BATCH NO.	SEQ NO.	TC	FD	COST CENTER	PROJECT/SUB	GR/SUB	OBJ	AGY OBJ	SFX	AMOUNT
							21						5,900.00

STATE OF TENNESSEE - NOTICE OF CORRECTION

DEPARTMENT OF GENERAL SERVICES, PURCHASING DIVISION, NASHVILLE, TENNESSEE 37219

DATE: 11/15/89	ALLOT. NO.: 329.01	REQN. NO.: P 3263	OBJ. CODE: 076	REF.:	CC: 152
----------------	--------------------	-------------------	----------------	-------	---------

SHIP TO: ON OR BEFORE BILL TO: SEND COPIES OF INVOICE

DEPARTMENT: Correction
 ADDRESS: Riverbend Max. Sec. Inst.
 7475 Cockrill Bend Road
 Nashville, TN 37209

F.O.B. DESTINATION	<input type="checkbox"/>
PREPAY AND ADD FRT.	<input type="checkbox"/>
CASH DISCOUNT	

PLEASE REFER TO THE ITEMS LISTED BELOW WHICH APPEAR ON THE PAPERS REFERRED TO HEREON AND WHICH NOW READ IN PART:

ITEM NO.	QTY.	UNIT	DESCRIPTION	BRAND OR GRADE	UNIT PRICE	AMOUNT
			NOW READS: Funds Not To Exceed \$42,000.00 FY 89-90			

CORRECTION TO READ:						
			MAKE READ: Funds Not To Exceed \$48,000.00 FY 89-90			

PROCESSED

NOV 22 1989

REASON FOR CORRECTION:

Funds Underestimated

DIRECTOR OF ACCOUNTS

Bennett/11 PURCHASE ORDER NO. 1 7/01/89 VENDOR X 20579	TOTAL → APPROVED: George Street DIRECTOR OF PURCHASING BY: <i>[Signature]</i>
--	---

FRED A. LEUCHTER ASSOCIATES., INC.

Modular Electrocution System

OPERATION

and

INSTRUCTION

MANUAL

**Department of Correction
State of Tennessee**

**Riverbend Maximum Security Institution
Michael Dutton, Warden**

**7475 Cockrill Bend Industrial Road
Nashville, Tennessee 37209**

November 27, 1989

**Fred A. Leuchter Associates, Inc.
231 Kennedy Drive
Unit 110
Boston, Massachusetts 02148
(617) 322-0104**

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DRAWINGS

1. Schematic--Modular Electrocuton System.
2. Schematic--Power Supply Test Unit.
3. Mechanical--Modular Power Supply.

System Description

Fred A. Leuchter Associates, Inc. manufactures a low-cost, state-of-the-art modular system for electrocution. The system utilizes solid state circuitry for control and timing, current regulation to five (50) milliamperes (1%) and single and two (2) station control for operation. It is designed with plug-in components for ease in repair and maintenance, and because of its modular design can be installed in very little time by untrained personnel.

The control system is designed for a timing sequence which will deliver two (2) one (1) minute jolts at minimum of 2400 volts ac spaced ten (10) seconds apart. To guarantee fail-safe operation, a redundant system's timer activates and shuts down the system if any of the sequential timers fail. Additionally, there are two (2) modes of operation: single station and two (2) station. In single station, one (1) push button switch controls the operation. In two (2) station, two (2) switches are utilized and logic (computer) circuitry determines which switch causes operation. The two (2) station mode precludes the use of an executioner, since no one knows which of the two (2) switches activated the system. The system does not retain the operating switch in memory. Further, since the controls are operated electronically, the operator handles only low voltage equipment, being completely isolated from the high voltage, guaranteeing operator safety.

The high voltage circuitry is designed to deliver 2640 volts ac upon activation and, as the load saturates and the current increases, the voltage stabilizes at (or above) 2400 volts ac. The current is limited to five (5) amperes, maximum, by a current regulator. The voltage, in accordance with the standard formula for admittance, will drop approximately 10% or 240 volts, but the current will never exceed five (5) amperes with 1% (five [50] milliamperes) regulation. A current limiting breaker protects the load in the event of a regulator failure and will open the circuit at six (6) amperes. The equipment is protected by a ninety (90) ampere overcurrent breaker.

THE FRED A. LEUCHTER ASSOCIATES, INC.
MODULAR ELECTROCUTION SYSTEM

The design of an electrocution system involves the consideration of a few, but very significant, requirements. Voltage, current, connections, duration and number of current applications (jolts).

Requirements

First, the system should contain three (3) electrodes. The head should be fitted with a tightly fitting cap containing an electrode with a saline solution moistened sponge. It is through this electrode that the current is introduced. Second, each ankle should be tightly fitted with an electrode, causing the current to divide and guaranteeing passage through the complete trunk of the subjects body. Use of one (1) ankle electrode (instead of two [2]) will almost always ensure a longer and more difficult electrocution. These two (2) ankle electrodes are the return path of the current. Contact should be enhanced by using saline salve or a sponge moistened with a saline solution at each of the ankle connections. It is of the utmost importance that good circuit continuity, with a minimum amount of resistance, be maintained at the electrode contacts. Further, a minimum of 2000 volts ac must be maintained, after voltage drop, to guarantee permanent disruption of the functioning of the autonomic nervous system. Voltages lower than 2000 volts ac, at saturation, cannot guarantee heart death and are, thus, not adequate for electrocution, in that they may cause unnecessary trauma to the subject prior to death. Failure to adhere to these basic requirements could result in pain to the subject and failure to achieve heart death, leaving a brain dead subject in the chair.

Medical Description

During electrocution there are two (2) factors that must be considered: the conscious and the autonomic nervous systems. Voltages in excess of 1500 volts ac are generally sufficient to destroy the conscious nervous system, that which controls pain and understanding. Generally, unconsciousness occurs in 4.16 milliseconds, which is 1/240 part of a second. This is twenty-four (24) times as fast as the subjects conscious nervous system can record pain. The autonomic nervous system

is a little more difficult, however, and generally requires in excess of 2000 volts ac to seize the pacemaker in the subjects heart. Generally, we compute the voltage at 2000 volts ac plus 20%. After the voltage is applied and the subjects body saturates, the voltage has dropped about 10% (depending upon the resistance of the electrode contacts and that of the subject body) and this should be taken into consideration, as well. Current should be kept under six (6) amperes to minimize body damage (cooking).

Ideally, the voltage is calculated thus:

The average man weighing 70 kilos (154 lbs.) requires 2000 volts ac to seize the heart.

Increase the voltage by 20% to accommodate subjects with greater resistance.

2000 volts ac plus 20% equals 2400 volts ac.

Increase voltage by 10% for drop at saturation.

2400 volts ac plus 10% equals 2640 volts ac.

Thus, the voltage should be 2640 volts ac.

This 2640 volts ac should be applied in two (2) jolts of one (1) minute each, spaced at a ten (10) second interval. On occasion, the subjects heart will spasm, instead of seizing, during the first application of current and the application of the second jolt will generally eliminate this problem. This spasm is due to excessive chemical build-up (acetylcholine and symphatin) at the nerve junctions and the ten (10) second wait generally allows for dissipation of the chemicals.

The Power Supply

The power supply consists of a 208 volt ac primary, 2640 volt as secondary transformer coupled to a saturable reactor with current monitoring circuitry, two (2) overcurrent limits and a high voltage contactor.

It is designed to deliver five (5) amperes at 1% (fifty [50] milliamperes) regulation at 2400 volts ac, plus 10% (240 volts ac). This means that when the circuit is closed, 2640 volts ac is fed into the load. As the load saturates, the current increases and the voltage drops. At approximately ten (10) seconds into operation, the load is fully saturated and will appear to be approaching a direct short circuit. The current regulator, however, limits the current to five (5) amperes at the saturation voltage point of 2400 (minimum) volts ac. If the current regulator fails, an overcurrent breaker is set to trip at six (6) amperes.

The system operates by monitoring output current, processing it in a direct current amplifier, and applying it to a direct current coil which controls the flux density in the core of the reactor. It is, essentially, a highly accurate magnetic amplifier.

Additionally, the power supply contains overcurrent protection for both the equipment and the load and an output contactor for closing the high voltage circuit to the Electric Chair. All connections to the power supply, except those for the 208 volts ac in, which are terminal block, are via two (2) military-type circular connectors.

The Control Console

The control console is a sloped metal panel cabinet containing the timing circuitry, computer controlled switching circuitry and controls for the system operation. It contains two (2) key switches for circuit control and a key-controlled fail-safe switch for high voltage output.

The timing sequence is accomplished with two (2) solid-state one (1) minute timers and one (1) ten (10) second timer cascaded from a system's timer of 130 seconds, guaranteeing system shutdown after 130 seconds even in the event of a sequential timer failure. Timer activation is all by precision relay.

One (1) and two (2) station control is standard and is facilitated by solid-state circuitry. In single station control, one (1) switch operates an electronic relay and activates the system. In two (2) station control, two (2) switches are utilized and the logic (computer) circuitry chooses the switch which will activate the relay. This insures that no one will know which operator controlled the circuit, as with a firing squad. The system does not retain the operating switch in memory.

The Electric Chair

The electric chair consists of an oaken chair with an adjustable backrest, inherent leg electrodes, a leather and sponge helmet with electrode, a drip pan, a plexiglass seat and a non-incremental restraint system. It is covered with a high gloss epoxy paint similar to that which is used in the space program. It is connected to the power supply via one military type connector. This chair was fabricated in part with wood from Tennessee's original electric chair.

The ankle electrodes, which are fabricated onto the leg stock, are turned of solid brass. They accommodate a #6 conductor and are paralleled to ground.

The helmet consists of an outer helmet of leather and an inner helmet of copper mesh and sponge. It will disassemble for repair and the electrode will accommodate a #6 conductor.

The chair design includes a removable drip pan. The straps are of nylon aircraft construction and consist of two (2) ankle straps, two (2) wrist straps and one (1) cross-the-chest harness, all with quick release fasteners. All fasteners comprising the restraints are non-incremental, enabling a tighter fit.

The entire system, because of its modular design, may be installed by non-technical people in several hours and is fully field repairable.

SPECIFICATIONS

Power Supply

Voltage: 208 volts ac in, 2400 volts ac plus 10% or 2640 volts ac out.

Current: five (5) amperes at 1% (fifty [50] milliampere) regulation.

Overcurrent protection: six (6) amperes; ninety (90) amperes; load and equipment respectively.

Input: 208 volts ac, 75 Amp, 60 Hz, 15.5 VA.
Disconnect rated 208 volts ac, 100 Amp.

Main transformer: Primary-195 volts ac, 68 amps, 13.2 KVA. Secondary-2640 volts ac, 5 amp.

Saturable reactor: 75 amp, 15 KVA.

Control transformer: Primary-208 volts ac.
Secondary-110 volts ac, 50-60 Hz, 750 KVA.

Meters: 1 volt, 1 amp.

Terminations: two (2) MS (military-type) circular connectors, console and high voltage output. Terminal block, 208 volts ac input.

Enclosure: NEMA 12.

Control Console

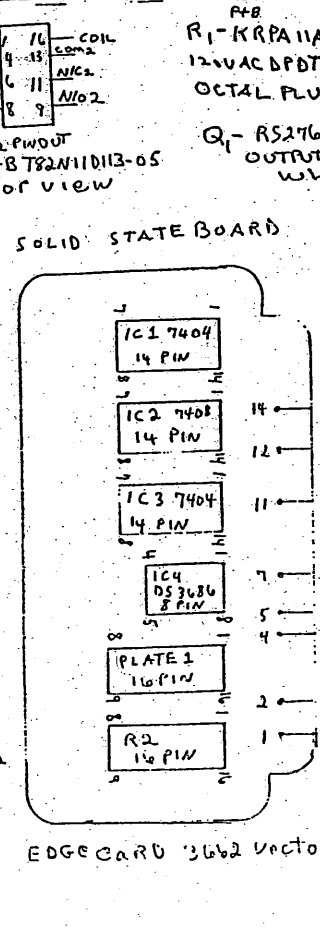
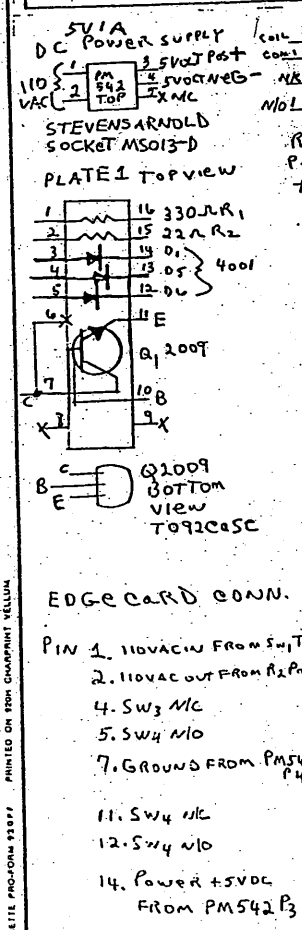
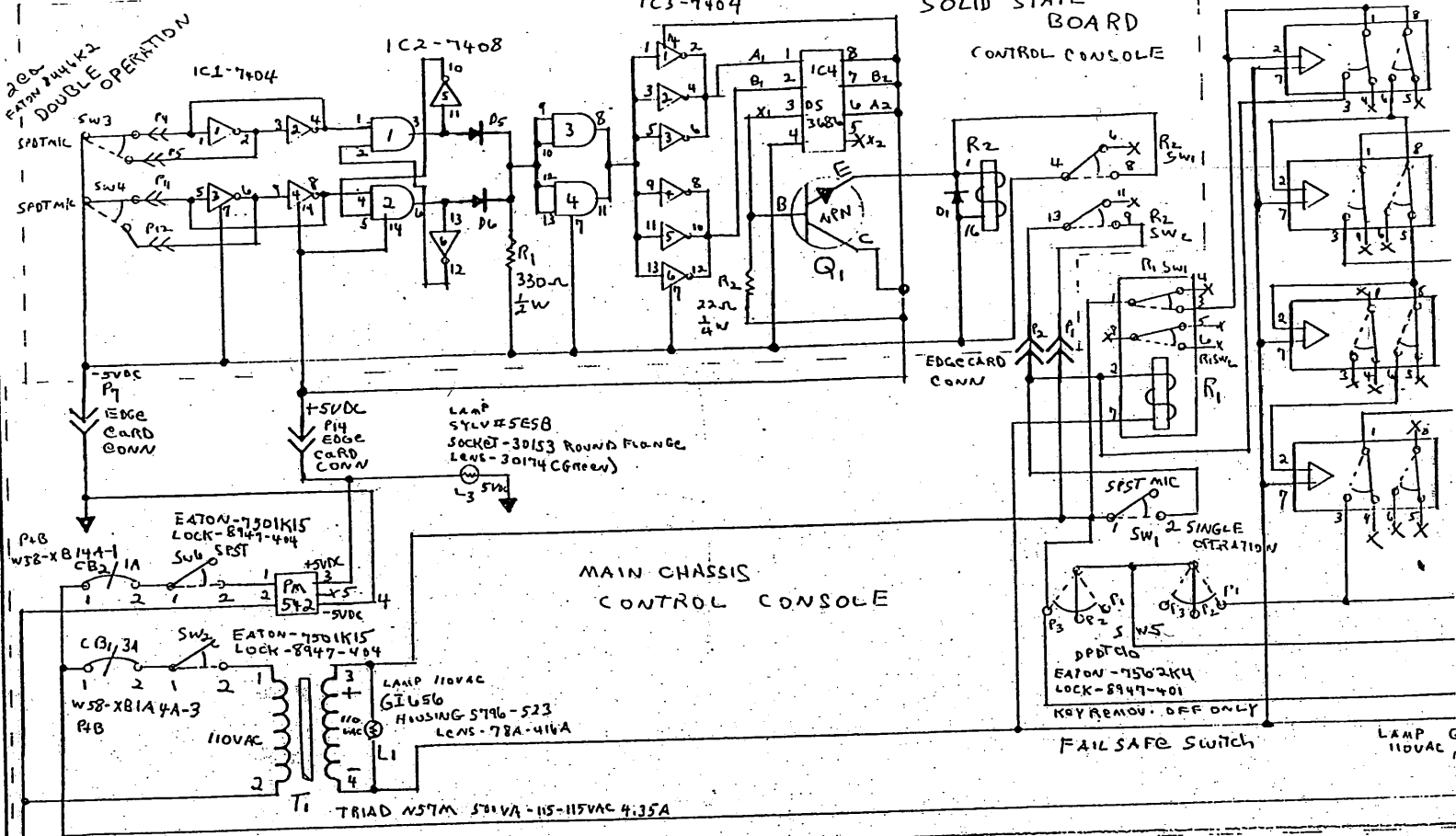
Voltage: 110 volts ac.

Overcurrent protection: one (1) ampere; three (3) ampere.

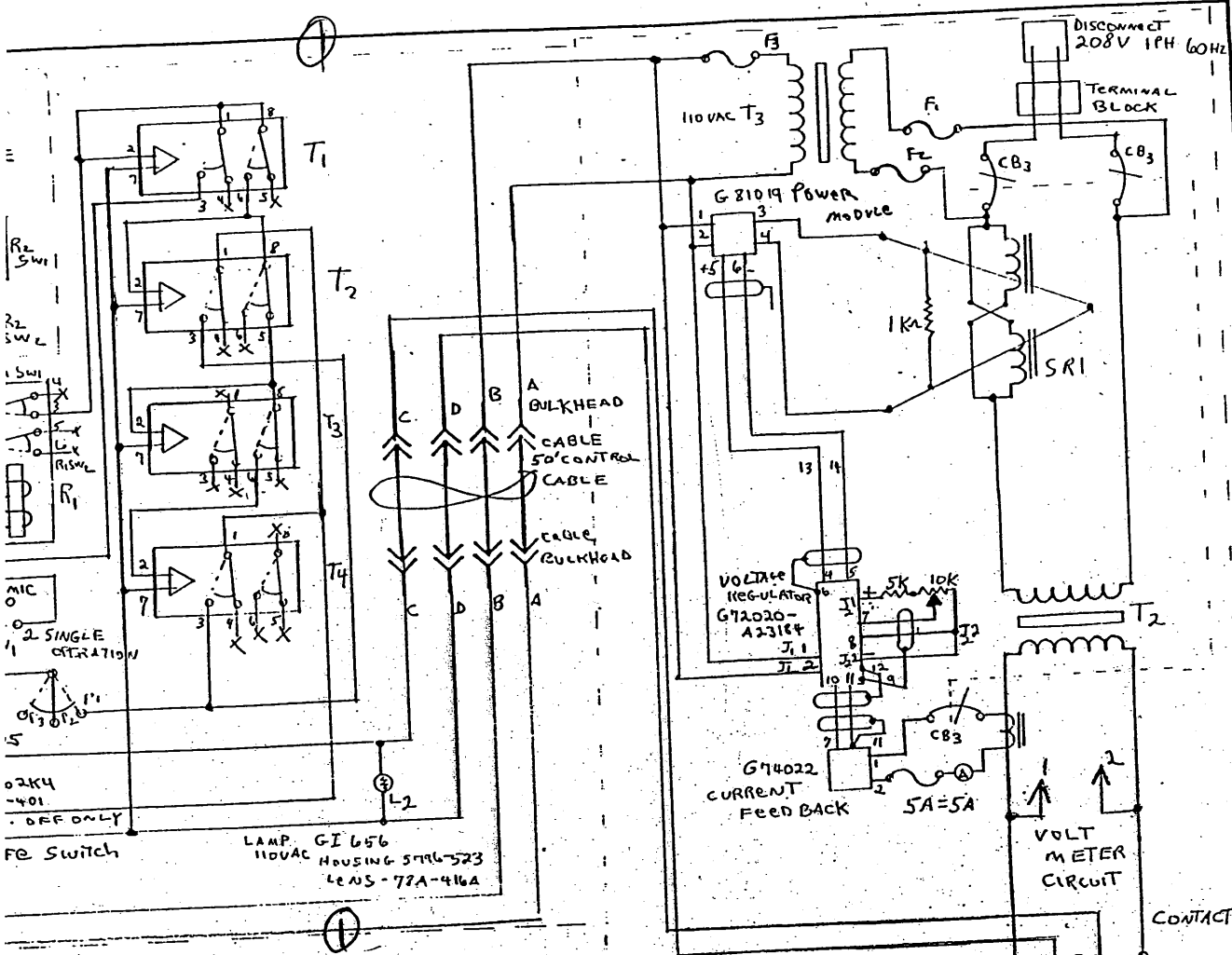
Timing: sequential--one (1) minute; ten (10) seconds; one (1) minute. All solid-state with a 130 second system's timer.

Switches: three (3) lock type--two (2) for circuit control operation, one (1) for system fail-safe; two (2) operator switches.

Terminations: one (1) MS (military-type) circular connector.



- TIMERS P4B - ALL OCTAL PLUGS**
- T1 CHB38-70023 (1-180sec)
Knob 120VAC 10A CONT DPDT
SET 130 SEC. INTERVAL ON
 - T2 CHB38-70022 (1-60sec)
Knob 120VAC 10A CONT DPDT
SET 60 SEC INTERVAL ON
 - T3 CHB38-70002 (1-60sec)
Knob 120VAC 10A CONT DPDT
DELAY ON OPERATE SET 10 SEC
 - T4 CHB38-70622 (1-60sec)
Knob 120VAC 10A CONT DPDT
SET 60 SEC INTERVAL ON
- D1, 5, 6 - 1N-4001
- TIMERS SET TO DELIVER**
- 2-MINUTE JOLTS OF 2640VAC
@ 5A SPACED 10 SEC. APART
CURR REG - 5A CURR LTD 6A
- SURGE PROTECTOR**
- 5K 5K 5K VAR. TP TP
0-3000VAC
0-10V = 0-3000V
- CONTROL CABLE C**
- AMPHENOL #'S
- MS 3102A 185-105 -
 - MS 25043-180 - B
 - MS 3106A 18-10P -
 - MS 3057-10A - C
 - MS 25042-180 -
- POWER CABLE**
- AMPHENOL #'S
- MS 3102A 28-7P
 - MS 25043-28D
 - MS 3106A 28-7P
 - MS 3057-10A -
 - MS 25042-28D
- SR1-NWL 347
CUR. REG. - N
Pow. MOD. - A
VOLTAGE REG. UNIT
FIRING CIRCUIT
- CONTACTOR, - VC 77
VOLT METER, - 0-300V
AMMETER, - 0-10A



①
= MATCH POINTS

CONTROL CABLE CONNECTORS
AMPHENOL #1'S 2EA.

- MS 3102A185-10S - BULKHEAD
- MS 25043-18D - BULKHEAD CAP.
- MS 3106A18-10P - CABLE
- MS 3057-10A - CABLE CLAMP
- MS 25042-18D - CABLE CAP

POWER CABLE CONNECTORS
AMPHENOL #1'S 2EA.

- MS 3102A28-7S - BULKHEAD
- MS 25043-28D - BULKHEAD CAP.
- MS 3106A28-7P - CABLE
- MS 3057-10A - CABLE CLAMP
- MS 25042-28D - CABLE CAP.

SR₁ - NWL 34768 - 75A, 15KVA
CUR. REG. - NWL-G 74022

UNIT {
POWER MOD. - NWL-G 81019
VOLTAGE REG. - NWL-G 72020
FIRING CIRCUIT - NWL-G 70001

CONTACTOR, - VC 77U02433 - 50SLW - CLARK
VOLT METER, - 0-3000V - 0-10V = 0-3000V
AMMETER, - 0-10A = 0-10A

POWER SUPPLY

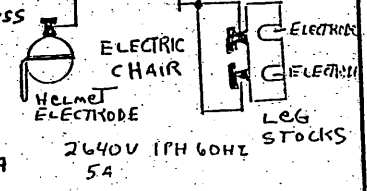
CB₃ - 250V 90A 2 POLE THERMAL
MAGNETIC BREAKER GANGED
AIRPAX - 219-2-1-61F-4-6-90

CB₃ 250V 6A FAST TRIP (GANGED)
AIRPAX - 219-1-1-60-3-3-6

F₁, F₂ - FNG 4A 500V BISS
F₃ - FNG 625 500V BUSS

T₂ - NWL 34770 -
PRI-195VAC 68A 13.2KVA
SNDY- 2640VAC 5A

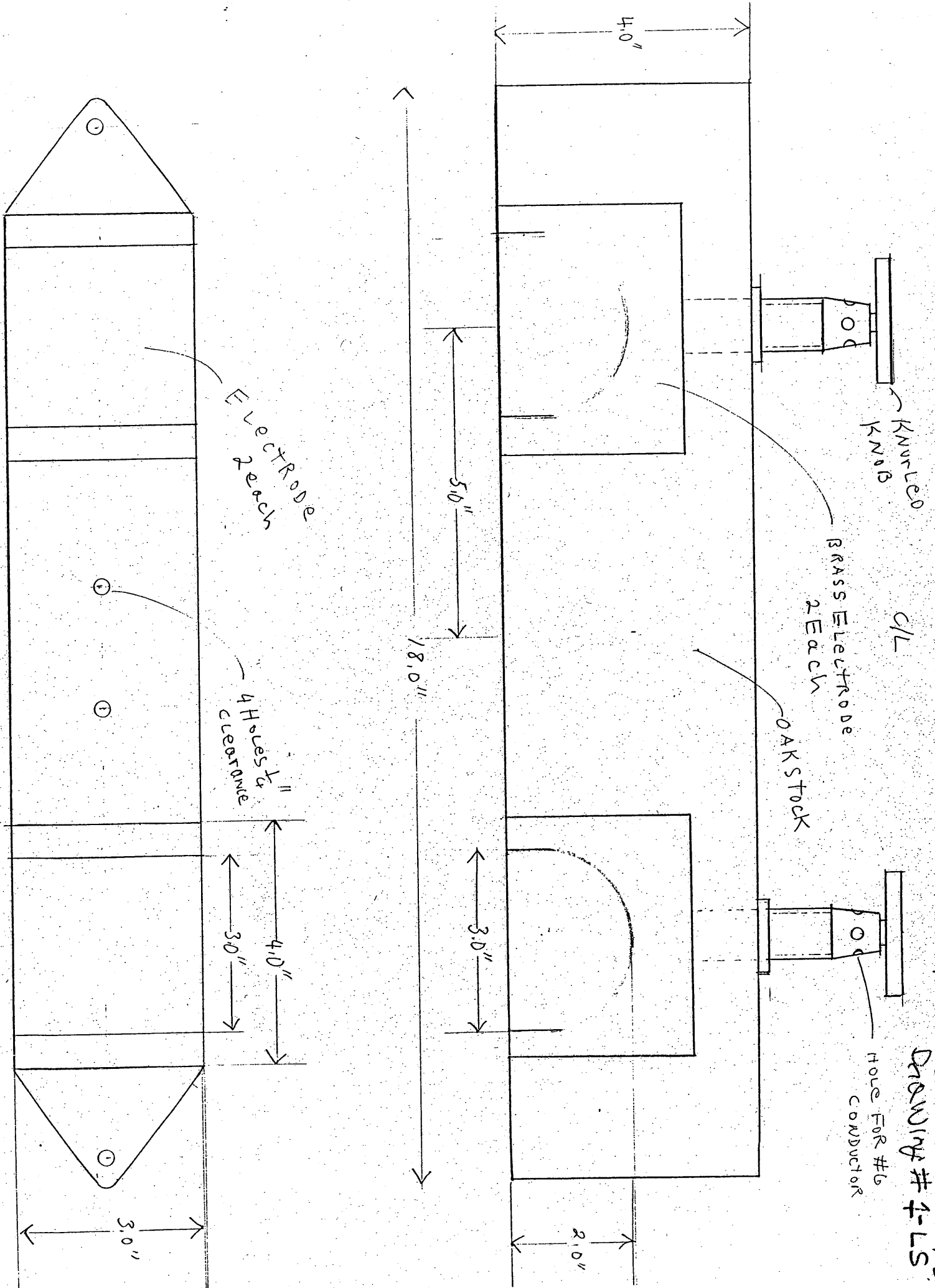
T₃ - 750VA 208P/115SECY 50-60HZ
WESTINGHOUSE # 1F1034



FRED A. LEUCHTER ASSOCIATES, INC.

SCALE: _____	APPROVED BY: _____	DRAWN BY: FAL
DATE: 10-6-89	DATE: 10-6-89	
MODULAR ELECTROCUTION SYSTEM		
STATE OF TENNESSEE	DRAWING NUMBER 5000-8-1	

Drawing # 4-LS



STRAPS NOT SHOWN - ONE EACH SIDE

Fred A. Leuchter Associates, Inc.
Consulting Engineers
231 Kennedy Dr. Unit 110
Boston, MA 02148

FAX (617) 321-3306

7) 322-0104

EQUIPMENT CERTIFICATION

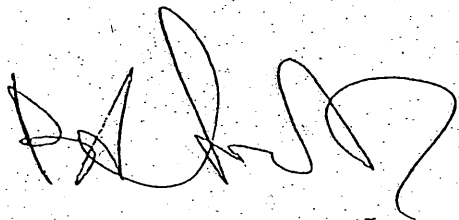
This is to Certify that on 29 November 1989 I, Fred A. Leuchter, Jr., did complete installation of the Fred A. Leuchter Associates, Inc. Modular Electrocutation System at the Riverbend Maximum Security Institution, Nashville, Tennessee. This System consists of an Electric Chair, a Control Console, a Power Supply and a Test Unit.

Upon completion of the installation, I did test said Modular Electrocutation System and found the System to perform satisfactorily, meeting all criteria of its design.

I, Fred A. Leuchter, Jr., Chief Engineer for Fred A. Leuchter Associates, Inc. and designer of the Modular Electrocutation System, do hereby Certify that this System is competent and ready to be utilized for the purpose for which it was constructed.

Signed this 2nd day of December, 1989 at Boston, Massachusetts.

Fred A. Leuchter Associates, Inc.



Fred A. Leuchter, Jr.
Chief Engineer

Execution Team
identifying information redacted

Fred A. Leuchter Associates, Inc.
Consulting Engineers
231 Kennedy Dr. Unit 110
Boston, MA 02148

FAX (617) 321-3306

322-0104

EQUIPMENT CERTIFICATION

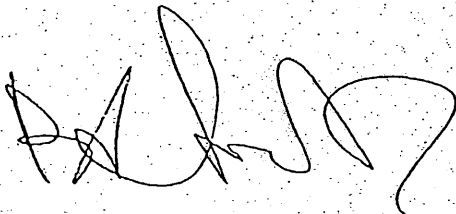
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Signed this 2nd day of December, 1989 at Boston, Massachusetts.

Fred A. Leuchter Associates, Inc.



Fred A. Leuchter, Jr.
Chief Engineer

FRED A. LEUCHTER ASSOCIATES, INC.

Certificate May it be known BY ALL

WHO READ THIS THAT
THIS CERTIFICATE HAS BEEN PRESENTED TO

FOR
Successfully completing The Fred A. Leuchter Associates, Inc.
Electrocutation Training Program and is hereby certified as

an
Electrocutation Technician

Fred A. Leuchter Associates, Inc.

ORGANIZATION



Fred A. Leuchter, Jr.

Chief Engineer

PRESENTED THIS 29th DAY OF Nov. 19 89

Certificate Number 1

FRED A. LEUCHTER ASSOCIATES, INC.

Certificate

Newly **BY** *the* **BY** *him*

WHO READ THIS THAT
THIS CERTIFICATE HAS BEEN PRESENTED TO

FOR

Successfully completing The Fred A. Leuchter Associates, Inc.
Electrocution Training Program and is hereby certified as
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Electrocution Technician

Fred A. Leuchter Associates, Inc.

ORGANIZATION



Signed *Fred A. Leuchter, Jr.*
Chief Engineer

PRESENTED THIS 29th Day of NOV. 19 89

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ORGANIZATION



SIGNER

Fred A. Leuchter, Jr.
Chief Engineer

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FRED A. LEUCHTER ASSOCIATES, INC.

Certificate

of
Ray W. Beacom
BY AIT

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Fred A. Leuchter Associates, Inc.

ORGANIZATION



SIGNED *[Signature]*
Fred A. Leuchter, Jr.
Chief Engineer

PRESENTED THIS 29th DAY OF NOV. 19 89

Certificate Number 4

FRED A. LEUCHTER ASSOCIATES, INC.

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ORGANIZATION



SIGNED
Fred A. Leuchter, Jr.
Chief Engineer

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SIGNER
Fred A. Leuchter, Jr.
Chief Engineer

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FRED A. LEUCHTER ASSOCIATES, INC.

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of
Way *At* *the* *Rank*
BY AIR

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ORGANIZATION



Signed: *[Signature]*
Fred A. Leuchter Jr.
Chief Engineer

PRESENTED THIS 29th DAY OF NOV. 19 89
Certificate Number 7

FRED A. LEUCHTER ASSOCIATES, INC.

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Fred A. Leuchter Associates, Inc.

ORGANIZATION



Signed: *[Signature]*
Fred A. Leuchter, Jr.
Chief Engineer

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FRED A. LEUCHTER ASSOCIATES, INC.

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Electroaction Technician

Fred A. Leuchter Associates, Inc.

ORGANIZATION

Signed *Fred A. Leuchter, Jr.*
Fred A. Leuchter, Jr.
Chief Engineer



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Fred A. Leuchter Associates, Inc.

ORGANIZATION

Signature: *[Handwritten Signature]*
Fred A. Leuchter, Jr.
Chief Engineer



PRESENTED THIS 29th DAY OF Nov., 1989

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SIGNED *[Signature]*
Fred A. Leuchter, Jr.
Chief Engineer



PRESENTED THIS 29th DAY OF NOV. 19 89

Certificate Number 11

FRED A. LEUCHTER ASSOCIATES, INC.

Certificate of Appreciation BY ALL

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ORGANIZATION

Signed

Fred A. Leuchter, Jr.
Chief Engineer



PRESENTED THIS 29th Day of NOV. 19 89

FRED A. LEUCHTER ASSOCIATES, INC.

Certificate

May 17th 1939
BYALL

WHO READ THIS THAT
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Fred A. Leuchter Associates, Inc.

ORGANIZATION



SIGNED *[Signature]*
Fred A. Leuchter, Jr.
Chief Engineer

PRESENTED THIS 29th DAY OF NOV. 19 89

Certificate Number 13

FRED A. LEUCHTER ASSOCIATES, INC.

Certificate of Appreciation BY ALL

WHO READ THIS THAT
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FOR

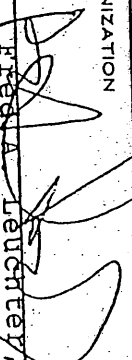
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Electrocution Technician

Fred A. Leuchter Associates, Inc.

ORGANIZATION

Signed  Fred A. Leuchter, Jr.
Chief Engineer

PRESENTED THIS 29th DAY OF NOV. 1989

Certificate Number 14



FRED A. LEUCHTER ASSOCIATES, INC.

Certificate

May 11th 1939
BY ALL

WHO READ THIS THAT

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Fred A. Leuchter Associates, Inc.

ORGANIZATION



SIGNED

Fred A. Leuchter, Jr.
Fred A. Leuchter, Jr.
Chief Engineer

PRESENTED THIS 29th DAY OF NOV. 1939

FRED A. LEUCHTER ASSOCIATES, INC.

Certificate

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Fred A. Leuchter Associates, Inc.

ORGANIZATION



SIGNED

[Signature]
Fred A. Leuchter, Jr.
Chief Engineer

PRESENTED THIS 29th DAY OF Nov. 19 89

Number 16

FRED A. LEUCHTER ASSOCIATES, INC.

Certificate

May it be known
BY ALL

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FOR

Successfully completing The Fred A. Leuchter Associates, Inc.
Electrocution Training Program and is hereby certified as
an

Electrocution Technician

Fred A. Leuchter Associates, Inc.

ORGANIZATION



Signed

Fred A. Leuchter, Jr.
Fred A. Leuchter, Jr.
Chief Engineer

PRESENTED THIS 29th DAY OF NOV. 19 89

FRED A. LEUCHTER ASSOCIATES, INC.

Certificate

May the Recour
BY ALL

WHO READ THIS THAT
THIS CERTIFICATE HAS BEEN PRESENTED TO

FOR

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ORGANIZATION



Signed
Fred A. Leuchter, Jr.
Chief Engineer

PRESENTED THIS 29th DAY OF NOV. 1989

Number 18

FRED A. LEUCHTER ASSOCIATES, INC.

Certificate of Appreciation BY ALL

WHO READ THIS THAT
THIS CERTIFICATE HAS BEEN PRESENTED TO

FOR

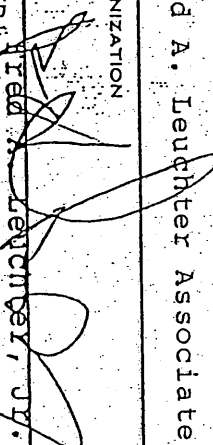
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Signed:  Fred A. Leuchter, Jr.
Chief Engineer

PRESENTED THIS 29th DAY OF NOV. 19 89

Certificate Number 19

FRED A. LEUCHTER ASSOCIATES, INC.

MODULAR ELECTROCUTION SYSTEM

MANUAL

STATE of TENNESSEE

FRED A. LEUCHTER ASSOCIATES., INC.

Modular Electrocutation System

OPERATION
and
INSTRUCTION
MANUAL

Department of Correction
State of Tennessee

Riverbend Maximum Security Institution
Michael Dutton, Warden

7475 Cockrill Bend Industrial Road
Nashville, Tennessee 37209

November 27, 1989

Fred A. Leuchter Associates, Inc.
231 Kennedy Drive
Unit 110
Boston, Massachusetts 02148
(617) 322-0104

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DRAWINGS

1. Schematic--Modular Electrocution System.
2. Schematic--Power Supply Test Unit.
3. Mechanical--Modular Power Supply.

THE FRED A. LEUCHTER ASSOCIATES, INC.
MODULAR ELECTROCUTION SYSTEM

The design of an electrocution system involves the consideration of a few, but very significant, requirements. Voltage, current, connections, duration and number of current applications (jolts).

Requirements

First, the system should contain three (3) electrodes. The head should be fitted with a tightly fitting cap containing an electrode with a saline solution moistened sponge. It is through this electrode that the current is introduced. Second, each ankle should be tightly fitted with an electrode, causing the current to divide and guaranteeing passage through the complete trunk of the subjects body. Use of one (1) ankle electrode (instead of two [2]) will almost always ensure a longer and more difficult electrocution. These two (2) ankle electrodes are the return path of the current. Contact should be enhanced by using saline salve or a sponge moistened with a saline solution at each of the ankle connections. It is of the utmost importance that good circuit continuity, with a minimum amount of resistance, be maintained at the electrode contacts. Further, a minimum of 2000 volts ac must be maintained, after voltage drop, to guarantee permanent disruption of the functioning of the autonomic nervous system. Voltages lower than 2000 volts ac, ✕ at saturation, cannot guarantee heart death and are, thus, not adequate for electrocution, in that they may cause unnecessary trauma to the subject prior to death. Failure to adhere to these basic requirements could result in pain to the subject and failure to achieve heart death, leaving a brain dead subject in the chair.

Medical Description

During electrocution there are two (2) factors that must be considered: the conscious and the autonomic nervous systems. Voltages in excess of 1500 volts ac are generally sufficient to destroy the conscious nervous system, that which controls pain and understanding. Generally, unconsciousness occurs in 4.16 milliseconds, which is 1/240 part of a second. This is twenty-four (24) times as fast as the subjects conscious nervous system can record pain. The autonomic nervous system

is a little more difficult, however, and generally requires in excess of 2000 volts ac to seize the pacemaker in the subjects heart. Generally, we compute the voltage at 2000 volts ac plus 20%. After the voltage is applied and the subjects body saturates, the voltage has dropped about 10% (depending upon the resistance of the electrode contacts and that of the subject body) and this should be taken into consideration, as well. Current should be kept under six (6) amperes to minimize body damage (cooking).

Ideally, the voltage is calculated thus:

The average man weighing 70 kilos (154 lbs.) requires 2000 volts ac to seize the heart.

Increase the voltage by 20% to accommodate subjects with greater resistance.

2000 volts ac plus 20% equals 2400 volts ac.

Increase voltage by 10% for drop at saturation.

2400 volts ac plus 10% equals 2640 volts ac.

Thus, the voltage should be 2640 volts ac.

This 2640 volts ac should be applied in two (2) jolts of one (1) minute each, spaced at a ten (10) second interval. On occasion, the subjects heart will spasm, instead of seizing, during the first application of current and the application of the second jolt will generally eliminate this problem. This spasm is due to excessive chemical build-up (acetylcholine and sympathin) at the nerve junctions and the ten (10) second wait generally allows for dissipation of the chemicals.

System Description

Fred A. Leuchter Associates, Inc. manufactures a low-cost, state-of-the-art modular system for electrocution. The system utilizes solid state circuitry for control and timing, current regulation to five (50) milliamperes (1%) and single and two (2) station control for operation. It is designed with plug-in components for ease in repair and maintenance, and because of its modular design can be installed in very little time by untrained personnel.

The control system is designed for a timing sequence which will deliver two (2) one (1) minute jolts at minimum of 2400 volts ac spaced ten (10) seconds apart. To guarantee fail-safe operation, a redundant system's timer activates and shuts down the system if any of the sequential timers fail. Additionally, there are two (2) modes of operation: single station and two (2) station. In single station, one (1) push button switch controls the operation. In two (2) station, two (2) switches are utilized and logic (computer) circuitry determines which switch causes operation. The two (2) station mode precludes the use of an executioner, since no one knows which of the two (2) switches activated the system. The system does not retain the operating switch in memory. Further, since the controls are operated electronically, the operator handles only low voltage equipment, being completely isolated from the high voltage, guaranteeing operator safety.

The high voltage circuitry is designed to deliver 2640 volts ac upon activation and, as the load saturates and the current increases, the voltage stabilizes at (or above) 2400 volts ac. The current is limited to five (5) amperes, maximum, by a current regulator. The voltage, in accordance with the standard formula for admittance, will drop approximately 10% or 240 volts, but the current will never exceed five (5) amperes with 1% (five [50] milliampere) regulation. A current limiting breaker protects the load in the event of a regulator failure and will open the circuit at six (6) amperes. The equipment is protected by a ninety (90) ampere overcurrent breaker.

The Power Supply

The power supply consists of a 208 volt ac primary, 2640 volt as secondary transformer coupled to a saturable reactor with current monitoring circuitry, two (2) overcurrent limits and a high voltage contactor.

It is designed to deliver five (5) amperes at 1% (fifty [50] milliamperes) regulation at 2400 volts ac, plus 10% (240 volts ac). This means that when the circuit is closed, 2640 volts ac is fed into the load. As the load saturates, the current increases and the voltage drops. At approximately ten (10) seconds into operation, the load is fully saturated and will appear to be approaching a direct short circuit. The current regulator, however, limits the current to five (5) amperes at the saturation voltage point of 2400 (minimum) volts ac. If the current regulator fails, an overcurrent breaker is set to trip at six (6) amperes.

The system operates by monitoring output current, processing it in a direct current amplifier, and applying it to a direct current coil which controls the flux density in the core of the reactor. It is, essentially, a highly accurate magnetic amplifier.

Additionally, the power supply contains overcurrent protection for both the equipment and the load and an output contactor for closing the high voltage circuit to the Electric Chair. All connections to the power supply, except those for the 208 volts ac in, which are terminal block, are via two (2) military-type circular connectors.

The Control Console

The control console is a sloped metal panel cabinet containing the timing circuitry, computer controlled switching circuitry and controls for the system operation. It contains two (2) key switches for circuit control and a key-controlled fail-safe switch for high voltage output.

The timing sequence is accomplished with two (2) solid-state one (1) minute timers and one (1) ten (10) second timer cascaded from a system's timer of 130 seconds, guaranteeing system shutdown after 130 seconds even in the event of a sequential timer failure. Timer activation is all by precision relay.

One (1) and two (2) station control is standard and is facilitated by solid-state circuitry. In single station control, one (1) switch operates an electronic relay and activates the system. In two (2) station control, two (2) switches are utilized and the logic (computer) circuitry chooses the switch which will activate the relay. This insures that no one will know which operator controlled the circuit, as with a firing squad. The system does not retain the operating switch in memory.

The Electric Chair

The electric chair consists of an oaken chair with an adjustable backrest, inherent leg electrodes, a leather and sponge helmet with electrode, a drip pan, a plexiglass seat and a non-incremental restraint system. It is covered with a high gloss epoxy paint similar to that which is used in the space program. It is connected to the power supply via one military type connector. This chair was fabricated in part with wood from Tennessee's original electric chair.

The ankle electrodes, which are fabricated onto the leg stock, are turned of solid brass. They accommodate a #6 conductor and are paralleled to ground.

The helmet consists of an outer helmet of leather and an inner helmet of copper mesh and sponge. It will disassemble for repair and the electrode will accommodate a #6 conductor.

The chair design includes a removable drip pan. The straps are of nylon aircraft construction and consist of two (2) ankle straps, two (2) wrist straps and one (1) cross-the-chest harness, all with quick release fasteners. All fasteners comprising the restraints are non-incremental, enabling a tighter fit.

The entire system, because of its modular design, may be installed by non-technical people in several hours and is fully field repairable.

SPECIFICATIONS

Power Supply

Voltage: 208 volts ac in, 2400 volts ac plus 10% or 2640 volts ac out.

Current: five (5) amperes at 1% (fifty [50] milliamperes) regulation.

Overcurrent protection: six (6) amperes; ninety (90) amperes; load and equipment respectively.

Input: 208 volts ac, 75 Amp, 60 Hz, 15.5 VA.
Disconnect rated 208 volts ac, 100 Amp.

Main transformer: Primary-195 volts ac, 68 amps, 13.2 KVA. Secondary-2640 volts ac, 5 amp.

Saturable reactor: 75 amp, 15 KVA.

Control transformer: Primary-208 volts ac.
Secondary-110 volts ac, 50-60 Hz, 750 KVA.

Meters: 1 volt, 1 amp.

Terminations: two (2) MS (military-type) circular connectors, console and high voltage output. Terminal block, 208 volts ac input.

Enclosure: NEMA 12.

Control Console

Voltage: 110 volts ac.

Overcurrent protection: one (1) ampere; three (3) ampere.

Timing: sequential--one (1) minute; ten (10) seconds; one (1) minute. All solid-state with a 130 second system's timer.

Switches: three (3) lock type--two (2) for circuit control operation, one (1) for system fail-safe; two (2) operator switches.

Terminations: one (1) MS (military-type) circular connector.

Electric Chair

Material: oak.

Electrodes: all turned of solid brass, two (2) leg, one (1) helmet.

Helmet: leather, copper mesh and sponge.

Straps: nylon, aircraft-type; quick release.

DISCLAIMER

Fred A. Leuchter Associates, Inc. assumes no liability for the intended or actual use of this device.

Begin Here for Process

SET-UP

1. Determine that the main disconnect is off. If not, turn off.
2. Determine that the Power Supply input circuit breaker is off. If not, turn off.
3. Determine that all switches on the Control Console are off: POWER ON switch and COMPUTER ON switch in left off position. Note specifically that ELECTRIC CHAIR FAILSAFE switch is in center off position.

4. Connect control cable between the Power Supply and the Control Console by inserting the polarized connectors and tightening the connector nuts. Connect the Control Console end first. Turn on the main disconnect and the Power Supply input circuit breaker, in that order. The power is now supplied to the Control Console.
5. Verify power at the Control Console by turning Power On switch to right and verify SYSTEM ON light. Turn COMPUTER ON switch to right and verify COMPUTER ON light.
6. Verify ELECTRIC CHAIR FAILSAFE SWITCH by turning switch to left (OPERATION POSITION). Note that the ELECTRIC CHAIR ENERGIZED light is not on. If light is on, there is a system malfunction or someone activated the timing sequence. VERIFY. Turn the ELECTRIC CHAIR FAILSAFE SWITCH off (center) and then to the left (TEST POSITION). Verify ELECTRIC CHAIR ENERGIZED light on. The Output contactor on Power Supply is closed. Turn all switches off in reverse sequence. Turn off the Power Supply input circuit breaker and the main disconnect, in that order.

Note Well: do not proceed unless the ELECTRIC CHAIR ENERGIZED light is OFF.

7. Complete test of Control Console as per instructions.
8. Complete test of Power Supply as per instructions.
9. Complete test of Electric Chair as per instructions.
10. Connect power cable between the Power Supply and the Electric Chair by inserting polarized connectors and tightening the connector nuts. Connect Electric Chair end first.
11. Turn on main disconnect.
12. Turn on Power Supply input circuit breaker. The Electrocutation System is now ENERGIZED and ready for use.

NOTE WELL: Turn off both main disconnect and input circuit breaker when not using chair.

DANGER THE SYSTEM IS LIVE. Follow to Operational Procedure.

OPERATIONAL PROCEDURE

1. Steps 1. through 12. of SET UP should have been completed earlier.
2. Determine that the main disconnect is off and that the input circuit breaker to the Power Supply is off. Remove all keys to the Control Console and determine that all switches are off. If not, turn off. Determine that the Electric Chair Energized light is off. If not, shut electric chair failsafe switch to off (center position). **DO NOT PROCEED UNLESS ELECTRIC CHAIR ENERGIZED LIGHT IS OFF.** Only one key is to be used for operation.
- * 3. Prepare subject for electrocution: Shave approximately a three inch (3") diameter spot on the top of executee's head. Cut pants off to knees, slit pants to knees or supply subject with short pants.
4. Mix a saturated saline (salt water) solution (add salt until it will no longer mix to lukewarm water).
5. Wet sponge in helmet (saturate).
6. Wet ankle sponges if a determination is made that they are to be utilized. Use of sponges is recommended in most cases.
7. Loosen all adjustments in restraint system and move backrest all the way back.
8. Refer to special Protocol for logistic procedure.
- * 9. Sedate subject either orally or with injection if permissible. A 5cc Injection of Versed (Midazolam HCL) 1 mg/ml has been used in the past for sedating executees. Orally, two (2) 50mg capsules of Nembutal Sodium (Pentobarbital sodium USP) Abbott Pharmaceuticals NDC 0074-3150-11. Another alternative would be 1.5 oz. of an 80 proof whiskey. This should be done one half (1/2) hour prior to the execution.
10. Curtain on witness window should be opened.
11. Subject must walk into execution chamber and speak to shown he is alive.
12. Curtain on witness window should be closed.

13. Executee should be strapped into chair in the following manner:

- A. Connect and tighten waist harness.
- B. Tighten shoulder adjustments.

NOTE WELL: All connectors should be kept centered by adjusting both sides of adjusters.

- C. Connect and tighten arm restraints, centering connectors.
- D. Insert subject's legs into electrodes on leg stock and connect and adjust the restraints keeping the connectors in the center. The saturated saline sponges are recommended and may be placed behind the subject's leg between the leg and the electrode.

NOTE WELL: All adjustments should be as tight as possible at this time.

- E. Install saline saturated helmet on the executee's head and tighten chin strap as tight as possible. The face curtain is optional and may be installed at this time.
- F. Insert helmet conductor into electrode on helmet and tighten handscrew. Tighten further with allen wrench.
- G. Loosen backrest adjuster, pull backrest as far forward as possible (tightening the subject) and tighten backrest adjuster locking the backrest in place.

NOTE WELL: Subject is now ready for execution.

- 14. Open the witness window curtain.
- 15. The Doctor should now examine the subject and certify that he is alive.
- 16. Turn on main disconnect.
- 17. Turn on input circuit breaker to the Power Supply.
- 18. On order from the Warden, the key will be inserted and the Power On switch will be turned on. The System On Light will be verified. The key will be removed.

19. On order from the Warden, the key will be inserted and the Computer On switch will be turned on only if a two operator procedure is to be utilized. The Computer On (Double) light will be verified. The key will be removed.
20. When the Warden determines that the execution will proceed, he will order that the key will be inserted and the Electric Chair Failsafe switch will be turned from center position to the Operation position to the left.

WARNING: THE SYSTEM IS NOW ARMED. DO NOT TOUCH THE ACTIVATION BUTTONS (SINGLE OR DOUBLE).

21. On order from the Warden, the execution will commence. One (1) or two (2) executioners will push either the SINGLE or DOUBLE buttons, simultaneously, if two. Verify the Electric Chair Energized light.

NOTE: The system will now deliver Two (2) Jolts of current, each for one (1) minute with a ten (10) second off time separating the two (2) Jolts. If a failure occurs on Double operation, simply activate the Single button and the timing sequence will proceed. If a further failure occurs, operate the system in manual by turning the Electric Chair Failsafe switch to TEST position (right) and time with a watch or clock: Sixty (60) seconds on; Ten (10) seconds off; Sixty (60) seconds on. Upon completion, turn Electric Chair Failsafe switch to off (center) position. Proceed with step twenty-two (22).

22. Upon completion of the timing sequence the subject should be dead. Turn off the Electric Chair Failsafe switch (center position) and VERIFY that the Electric Chair Energized light is off. Do NOT proceed unless the Electric Chair Energized light is off.
23. Use key to shut off Computer On switch and Power On switch, both to the left in this order.
24. Shut off input circuit breaker to the Power Supply and the main disconnect, in this order.

NOTE: If Electric Chair Energized light is not off, turn off main disconnect.

25. The Doctor should now verify heart death of the executee.

NOTE: If death has not occurred, Proceed with steps sixteen (16) through Twenty-five (25) again.

26. The execution is now over.

27. Close witness window curtain and remove witnesses.

28. Verify that all switches are off and the key removed. Verify that the input circuit breaker to the Power Supply is off. Verify that the main disconnect is off. Do NOT proceed until this step is complete and the Electric Chair Energized light is off.

28. The Executee should be removed from the chair in the following manner:

A. Disconnect helmet in reverse procedure of thirteen (13) F. Loosen and remove Helmet.

B. Pull release on ankle fasteners and pull legs forward.

C. Pull release on arm fasteners and free arms.

D. Pull release on chest harness fastener and subject's body will slump forward and hang in harness.

E. Remove subject's body to storage or pick-up location.

29. Clean chair seat with lysol or similar disinfectant and mild soap. Clean electrodes and with mild soap and water. Thoroughly dry chair. Wash and dry leg sponges.

30. Remove and dump drip pan; wash, dry and replace.

31. Clean helmet with clear water and dry. Store on styrofoam head.

32. Re-connect restraint system fasteners and partially tighten.

33. Verify all switches and power off.

34. Disconnect both the control cable and the power cable and coil for storage.

35. Remove all Keys.

RIVERBEND MAXIMUM SECURITY INSTITUTION

EXECUTION PROTOCOL

ELECTROCUTION PROCEDURE

Follow special instructions in separate document in conjunction with the afore defined SET UP and OPERATIONAL PROCEDURE.

FRED A. LEUCHTER ASSOCIATES, INC.

MODULAR ELECTROCUTION SYSTEM

MAINTENANCE AND TEST PROCEDURE

1. Inspect both cables for wear or damage. Repair if necessary.
2. Inspect helmet for wear or damage. Tighten screw. Repair if necessary. Check for continuity.
3. Inspect sponges for serviceability. Replace if necessary.

CONTROL CONSOLE TEST

4. Inspect chair for wear or damage. Clean electrodes with metal cleaner or steel wool. Tighten electrode connections with allen wrench. Check all wiring on chair for continuity.
5. Determine that the main disconnect is off and that the input circuit breaker to the power supply is off.
6. Connect control cable between the Control Console and the Power Supply, Control Console end first.
7. Turn on main disconnect.
8. Turn on input circuit breaker to Power Supply.
9. Turn on Power On switch. Verify System On light.
10. Turn on Computer On Switch. Verify Double light on and power to the computer. If either lamp fails, push appropriate circuit breaker or replace lamp.
11. Turn Electric Chair Failsafe switch to Operation position (left). Verify Electric Chair Energized lamp is NOT on. Turn switch to Off (center) position.
12. Turn Electric Chair failsafe switch to Test (Right) position. Electric Chair Energized lamp should be on. If lamp fails, replace lamp.
13. Turn all switches off in reverse order.
14. Turn on Power On Switch. Turn Electric Chair Failsafe switch to operation (left) position.

The following is a test for the timing sequence and should be performed with a stopwatch.

15. Push Single operation button. Timing sequence should begin. Verify by timing duration of the Electric Chair Energized Light. Sequence should be sixty (60) seconds on; ten (10) seconds off; sixty (60) seconds on. If timing sequence is incorrect, re-set timers. Turn Power On switch off each time a sequence is initiated to reset system. Timer 1 is Systems Timer and must be set last. To begin reset, turn Timer 1 all the way up to maximum time. Set Timer 2 for sixty (60) seconds. Set Timer 3 for ten (10) seconds. Set timer 4 for sixty (60) seconds. Then set Timer 1 for one hundred-thirty (130) seconds. Precision on timer setting for timers 2, 3 and 4 may vary by several seconds but timer 1 must be set at a time which exceeds the total of the other three timers. Remember, for each timing sequence the system must be reset by turning Power On switch off between sequences. Turn Electric Chair Failsafe switch off; turn Computer On switch off; turn Power On switch off.

The following test is for the computer portion of the system.

16. Turn Power On switch on. Turn Computer On switch on. Verify System On and Double lights as operational. Turn Electric Chair Failsafe switch to Operation (left) position. Push left button for Double operation, alone. Allow system to sequence. To re-set, turn all switches off in reverse order. Push right button, alone. Allow system to sequence. Re-set. Push both left and right buttons, simultaneously. Allow system to sequence. Verify Electric Chair Energized light as operational for each sequence. Turn all switches off in the reverse order. Verify all lamps as off. The system is now re-set.

This concludes the low voltage portion of the test. The following test for the Power Supply should be conducted with great care in that it utilizes the full 2640 Volts.

DANGER

POWER SUPPLY TEST

This test is to be conducted with the Fred A. Leuchter Associates, Inc. Electric Chair Modular Power Supply Test Unit. It may be conducted without the Test Unit as long as the test requirements are met. Test should be conducted with an equivalent of 528 ohms resistance at 13.2Kw. Some provision should be made to cool the resistor.

17. Verify that the main disconnect and the Power Supply input circuit breaker are both in the off position. Verify that all switches on the Control Console are off. Verify that the ELECTRIC CHAIR ENERGIZED LAMP IS OFF. Do NOT proceed unless all of the above conditions are met.
18. Connect the power cable between the Power Supply and the Electric Chair Modular Power Supply Test Unit, Test unit end first. This is connected in the same manner as is the Electric Chair.
19. Plug in Electric Chair Modular Power Supply Test Unit to 110 vac. Turn on fan switch and verify quadrafan is functioning.
20. Turn on main disconnect. Turn on Power Supply input circuit breaker.
21. Turn on Power On Switch on Control Console. Verify System On light.
22. Turn Electric Chair Failsafe switch to operation position. The Test is now ready. Keep clear of Electric Chair Modular Power Supply Test Unit.
23. Push single operator button to initiate test. Verify Electric Chair Energized light is on. System will sequence through timed execution. Monitor both voltmeter and ammeter on Power Supply to determine if both voltage and current are proper. Voltage should never drop below two-thousand (2000) vac and current should never exceed five (5) amperes. If any failure occurs, disconnect main and service system. At the end of the timing sequence the system will shut down and the test will be complete. Verify Electric Chair Energized light is off.
24. At sequence completion, turn Electric Chair failsafe switch to off. Verify Electric Chair Energized light is off. Turn Computer On switch to off, if used. Turn System On switch to off. Verify all lamps are out.

This test may be repeated as often as desired but not to exceed twice (2 times) in a ten minute interval.

This test may be accomplished alternatively without the use of the timing sequence utilizing the Electric Chair Failsafe switch in TEST position. Care must be taken not to exceed a time greater than four minutes or within a ten (10) minute time period. You must turn the Electric Chair Failsafe switch to off position in order to terminate the test. This procedure should be done with a clock or stopwatch and only by a trained technician, electrician or plant engineer. A too-long duty cycle will damage the Test Unit and the Power Supply.

25. Shut off Power Supply input circuit breaker. **SHUT OFF MAIN DISCONNECT.**
26. Turn off fan and disconnect the Electric Chair Modular Power Supply Test Unit from the 110 vac. Put Test Unit away.
27. If System is to be used, connect the Electric Chair and repeat the test utilizing the timing sequence: Steps 20 through 25. If no use is to occur, disconnect the power cable from the Power Supply and store.
28. Verify All switches on the Control Console are off especially the Electric Chair Failsafe switch. Verify that the Power Supply input circuit breaker is off. Verify that the main disconnect is off.

SERVICE

1. Control Console. Service and repair should be performed by a Certified Electrocution Technician, electrician or technician. A schematic is enclosed. In most cases, a complete replacement of all plug in components can be accomplished by an untrained person. This will generally repair the system unless there is a defective switch or a broken wire.
2. Power Supply. Service and repair should be performed by a Certified Electrocution Technician with an electrician or technician. A manual and schematic are enclosed.
3. Testing of all components including the chair should be done by a Certified Electrocution Technician.

INSTALLATION

1. Fasten Electric Chair to floor.
2. Fasten Control Console to the Floor.
3. Fasten Power Supply to floor.
4. Verify main disconnect is off. Wire from main disconnect and connect conductors to terminals of the Power Supply.
5. Proceed with test as described in MAINTENANCE AND TEST PROCEDURE.

THE ELECTRIC CHAIR MODULAR POWER SUPPLY TEST UNIT

The Fred A. Leuchter Associates, Inc. Modular Power Supply Test Unit is especially designed for use with the Fred A. Leuchter Associates, Inc. Modular Electrocution System. It replaces the electric chair in the system during testing and simulates the load of the chair occupied by an executee.

It contains an especially fabricated, harmonically balanced, twenty (20) component, high wattage resistor package which is cooled by a quadrafan assembly having an area of some 255 square inches and an aggregate airflow of some 2320 cfm. It mates with the connector to the electric chair.

SPECIFICATIONS

Test circuit

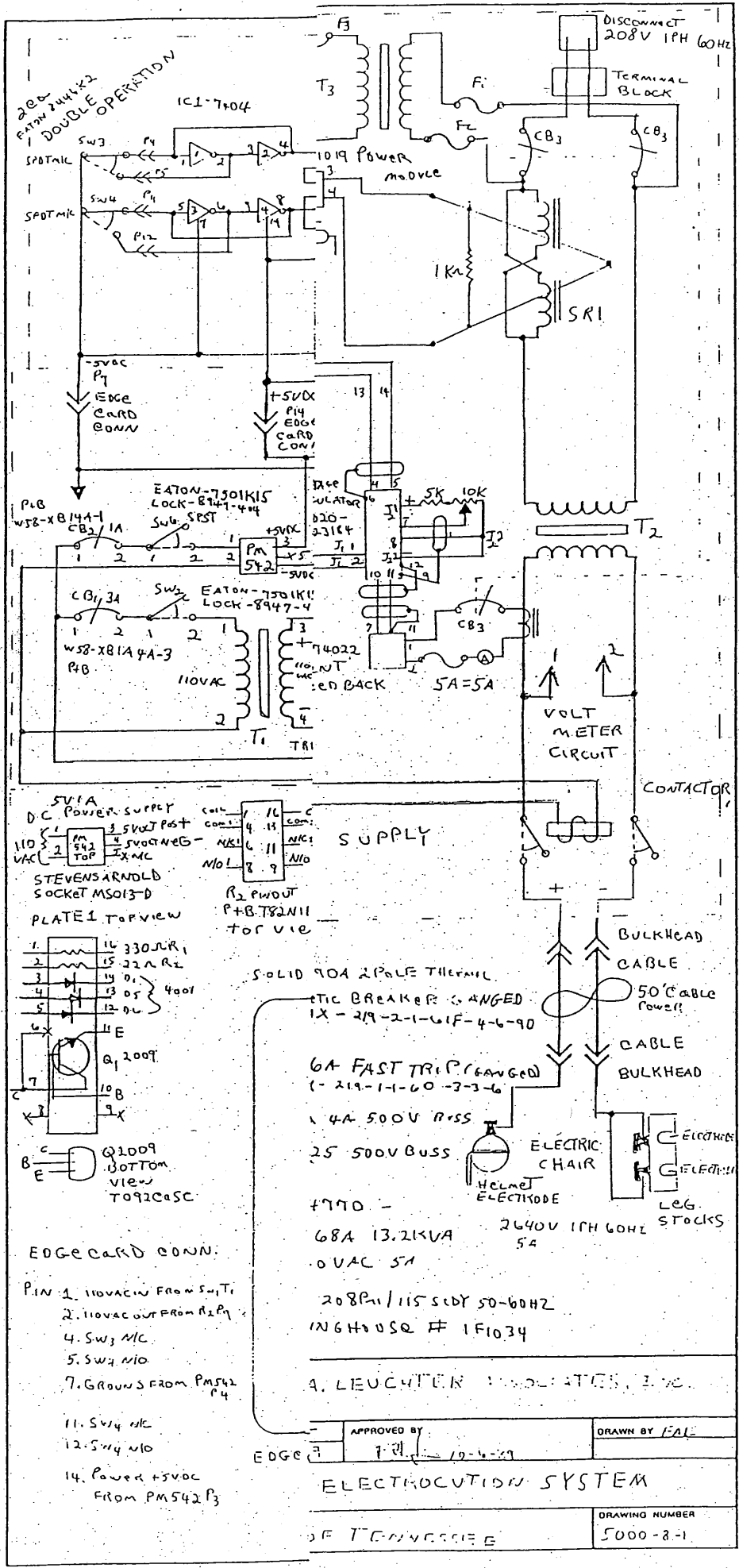
Resistor Bank: Twenty (20) 26.4 ohm 375 watt resistors; total impedance 528 ohms, total wattage (KVA) 7500 at 200 % rating. Total 15 KVA.

Quadrafan circuit

Rating: 115 volts ac, 1.4 amps, 144 watts.

This test unit operates at 15 KVA, DO NOT touch unit while test is in progress.

END

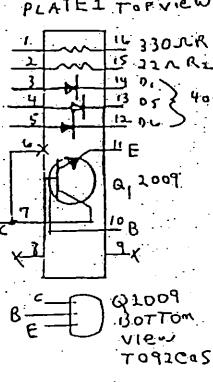


208V
EATON 750K15
DOUBLE OPERATION

PcB
WS8-XB144-1
CB2/1A

PcB
WS8-XB1A4A-3
CB2/3A

5V1A
D.C. POWER SUPPLY
STEVENSON
SOCKET MS013-D



EDGE CARD CONN:
PIN 1. 110VAC IN FROM SW1 T1
2. 110VAC OUT FROM R2 P1
4. SW3 MC
5. SW4 MO
7. GROUND FROM PMS42 P4
11. SW4 MK
12. SW4 MO
14. Power +5VDC FROM PMS42 P3

SUPPLY
SOLID 90A 2 POLE THERMAL
ELECTRIC BREAKER (CHANGED)
1X-2/9-2-1-61F-4-6-90
6A FAST TRIP (CHANGED)
1-219-1-1-60-3-3-6
1.4A 500V BUSS
25 500V BUSS
ELECTRIC CHAIR
HELMET ELECTRODE
ELECTRODE
LEG STOCKS
2640V 1PH 60HZ
5A
7970 -
68A 13.2KVA
0VAC 5A
208V 1PH 60HZ
INGHUSQ # 1F1034
A. LEUCHTER : MODULATORS, 2 VDC
APPROVED BY: [Signature] 10-4-79
DRAWN BY: EAL
ELECTROCUTION SYSTEM
DRAWING NUMBER: 5000-2-1

COURTESY PHOTOGRAPH 19877 PAINTED ON 100% CHAMPIGNON YELLOW

TELEPHONE NO. 555-3326
 WATTS 1-800-331-7326

POST OFFICE DRAWER 1307 · 509-511 N. PINELLAS AVE.
 TARPON SPRINGS, FL 34689-1307 PHONE 813 937-3851
 D-U-N-S 04-149-6548



CAREWARE HOME & AUTO CARE PRODUCTS SINCE 1943

INVOICE

INVOICE NUMBER **H-21130**

INVOICE SEQUENCE NO. **1803** CUSTOMER NO. **pe** A VENDOR NUMBER

ORDER NUMBER	DATE	RECEIVED	SHIPPED VIA	CARRIER	F.O.B. POINT	TERMS	INVOICE DATE
6159	2/19	2/19	Ups Next day		T.S. Fla	C.O.D.	3-5-91

ORDERED BY **Jay Wiechert** PHONE NO. **501/782-5587** SALESMAN **NG/O** TERR. **6** CODES **---/---** NO RETURNS OR CREDITS ALLOWED WITHOUT PRIOR WRITTEN INSTRUCTIONS.

SOLD TO Wiechert Mfg Co.
 1100 Towson Ave
 Ft Smith, AR 72901

SHIP TO *New Account*

PACKING	CATALOG NO.	SIZE	INTERNAL SF.	DESCRIPTION	TOTAL UNITS SHIPPED	UNIT PRICE	EXTENSION
cs/6	RI-100	10-11"		Rock Island Wool sponge bulk	6	18.52	111.12

TOTAL CASES	1 CS	SF-0	YOU MAY DEDUCT \$ 0 IF PAID ON OR BEFORE	EXTENSION TOTAL	111.12
TOTAL WEIGHT	34		CASH DISCOUNT ALLOWED ONLY IF POSTMARKED BY DATE INDICATED ABOVE	SHIPPING CHARGES	19.25
			SERVICE CHARGE OF 2% PER MONTH ON ALL PAST DUE ACCOUNTS OVER 30 DAYS	TOTAL	130.37

INVOICE NUMBER **H-21130** Ship **ASAP** **C.O.D.**

ORDERS ACCEPTED SUBJECT TO PRICES IN EFFECT AT TIME OF SHIPMENT. OWNERSHIP RIGHTS FOR MERCHANDISE SHIPPED UNDER THIS INVOICE RESERVED BY SFCO INC. TYPOGRAPHICAL ERRORS SUBJECT TO CORRECTION. WE ASSUME NO LIABILITY FOR ANY LOSS OR DAMAGE WHILE IN TRANSIT. CLAIMS FOR ANY SHORTAGES MUST BE MADE WITHIN 10 DAYS FROM ABOVE DATE. CONDITIONS NOT SPECIFICALLY STATED HEREIN SHALL BE GOVERNED BY ESTABLISHED TRADE CUSTOMS. PROCURED UNDER EARL TRADE.

Dutton

Filed for Introduction on 2/03/93

SENATE BILL NO. 632
by
Koella.

AN ACT to amend Tennessee Code Annotated, Titles 39 and 40, relative to the execution of a sentence of death.

BE IT ENACTED BY THE GENERAL ASSEMBLY OF THE STATE OF TENNESSEE:

SECTION 1. Tennessee Code Annotated, Section 40-23-114 is amended by deleting the section in its entirety and substituting instead the following:

(a) Whenever any person is sentenced to the punishment of death, the court shall inform the defendant of the three (3) methods by which the death sentence may be executed. Upon being informed of such methods, the defendant shall elect one (1) of the following methods:

- (1) Death by lethal injection;
- (2) ~~Death by hanging~~; or *electrocution*
- (3) Death by firing squad.

(b) If the defendant refuses to elect one (1) of such methods, the judge shall so note in the record and shall order that the defendant be executed by lethal injection.

SECTION 2. Tennessee Code Annotated, Section 40-23-115, is amended by deleting the section in its entirety and substituting instead the following:

The commissioner of correction shall establish by rule promulgated pursuant to Tennessee Code Annotated, Title 4.

14395018

77136

Post-It™ brand fax transmittal memo 7671 # of pages 7

To	Mike Dutton	From	Jim Thrasher
Co.	Riverbend	Co.	Correction
Dept.		Phone #	741-6898
Fax #		Fax #	741-4605

Chapter 5, all procedures and guidelines necessary to carry out a sentence of death by each of the methods authorized by Tennessee Code Annotated, Section 40-23-115.

SECTION 3. Tennessee Code Annotated, Section 40-23-116, is amended by deleting from the first sentence of subsection (a) the words "chamber is located" and substituting instead the words "sentence is to occur".

SECTION 4. Tennessee Code Annotated, Section 40-23-116, is further amended by deleting the second sentence of subsection (a) and substituting instead the following:

On the date fixed for such execution in the judgment and mandate of the court, the warden of the state penitentiary in which the death sentence is to occur shall cause it to be carried out in a place prepared for that purpose in strict seclusion and privacy.

SECTION 5. Tennessee Code Annotated, Section 40-23-119, is amended by deleting the words "chamber is located" and substituting instead the words "sentence is to occur".

SECTION 6. This act shall take effect on July 1, 1993, the public welfare requiring it and shall apply to all persons receiving a sentence of death on or after such date.



Fred A. Leuchter Associates, Inc.
 Execution Technology
 231 Kennedy Dr. Unit 110
 Boston, MA 02148

(617) 322-0104

FAX (617) 321-3306

TELEFAX MESSAGE

TYPE OF MESSAGE: NORMAL URGENT MOST URGENT X

DATE: 2-11-93

TO: Mr. Tom Joplin FAX # 615-350-3400
 Riverbend Maximum Security Institution
 Nashville, Tennessee 37209

FROM: Fred A. Leuchter, Jr.

REFERENCE: Telcon 2-11-93 A.M.

TOTAL NUMBER OF PAGES INCLUDING COVER SHEET: 2

PLEASE CALL IMMEDIATELY IF YOU DO NOT RECEIVE ALL PAGES OR HAVE ANY PROBLEMS IN RECEPTION.

Dear Tom,

The following prices are good for 90 days except for the expenses, which are close approximations.

Lethal Injection Machine

Post-it brand fax transmittal memo 7871 2nd page

TO	FRED A. LEUCHTER
FROM	MR. JOPLIN
DATE	2-11-93
TIME	3:50 PM
NO.	741-4605

- 1 ea. Modular Lethal Injection Machine consisting of a computerized Control Module and a Delivery Module with mechanical back-up. Includes Two (2) test kits and two (2) operational set-ups, less chemicals. All as per the accompanying specification.

F.O.B. Boston \$38,900.00

2. Installation and Training and Certification. 4,100.00

3. Shipping 300.00

4. Expenses 3,000.00

Total \$46,400.00

Gallows

1. Complete Gallows, aluminum and steel with computer control, hydraulic release and protocol.	\$62,000.00
2. Accessories: pre-treated upper body restraints, leg restraints, neck sleeves, mechanical slipknot and collapse frame.	4,900.00
3. Shipping	2,000.00
4. Installation	5,000.00
5. Test and Training	<u>3,500.00</u>
Total	\$77,400.00

Fixing Squad

1. Protocol, Chair (with restraints), T-shirts.	\$3,200.00
2. Training	<u>3,800.00</u>
Total	\$7,000.00

If you proceed, I will give you a formal quote for each item, with specifications.

If you need anything else, please feel free to call.

Very truly yours,



Fred A. Leuchter, Jr.

(H)
State of Tennessee
Office of the Attorney General
450 James Robertson Pkwy.
Nashville, Tennessee 37243-0485

- 1) Ex. team
- 2) Tech. Staff
- 3) Team leader
putting in chain
Pre-TEST

Facsimile Transmission
615-741-7327

Transmitting 5 pages, including cover sheet

Date: 4/16/94

TO: Jerry Moore

FROM: Glen Riden

Telephone no. 615-741-7070

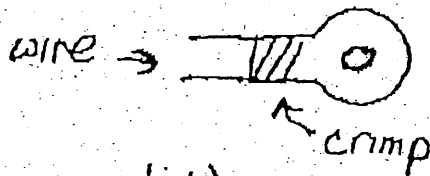
Comments: _____

Rush hand delivery to receiver? Yes

The information contained in this facsimile message is intended only for the use of the individual or entity named above. If the reader of this message is not the intended recipient, or the employee or agent responsible to deliver it to the intended recipient, you are hereby notified that any dissemination, distribution, or copying of this communication is strictly prohibited. If you have received this communication in error, please immediately notify us by telephone, and return the original message to us at the above address via the U.S. Postal Service. Receipt by anyone other than the intended recipient is not a waiver of any attorney-client or work-product privilege.

List of supplies

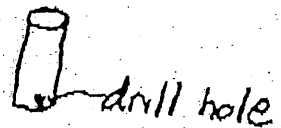
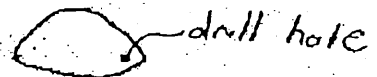
- 1 Inductive ammeter (0-20 Amps)
- 1 DMM Digital Multimeter
- 1 Analog Multimeter
- 1 20:1 Stepdown Transformer (Example GE Type JH-2 potential Transformer)
or
Cat # 76X226
- 1 High Voltage Probe
- 1 Megaohm-meter (Megger)
- 6 6 Foot lengths of wire (heavy gauge) with loop connectors on the ends



1 Hemisphere (metal)

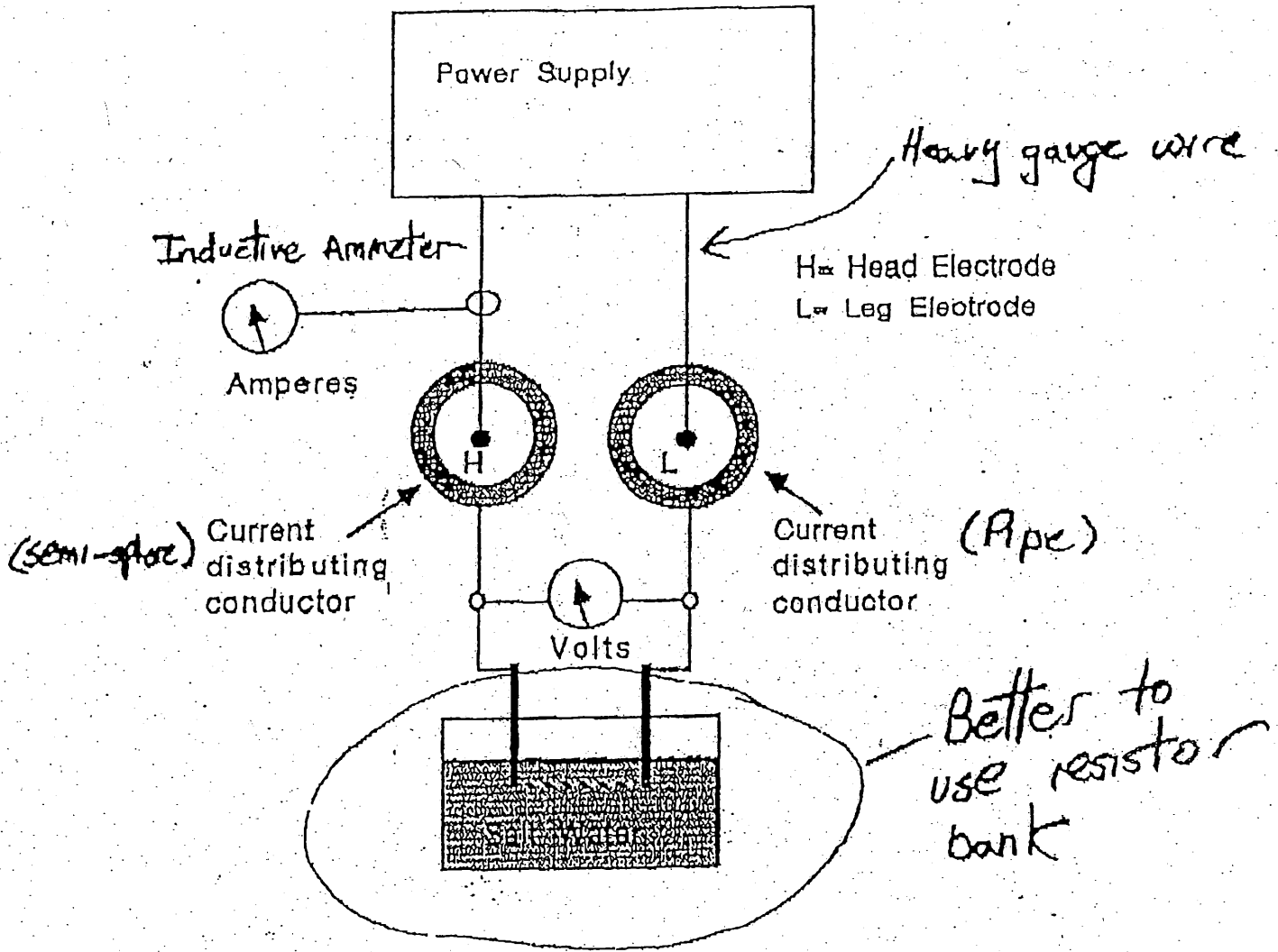
1 Length of pipe (metal)

Assorted power tools (drills) and nuts and bolts.
Test load (Variable) 100-400 Ω
(see next two pages)

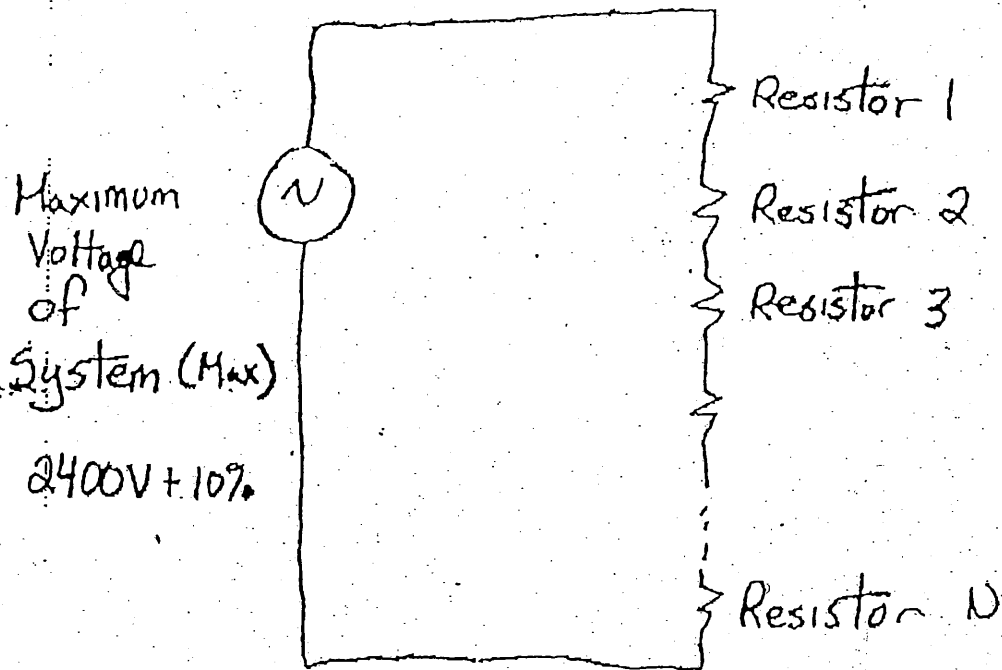


Documentation on all equipment

EXHIBIT 2: Electric Chair Test Circuit



Test Dummy Load:



We need to control the resistance from 100 to 400 ohms

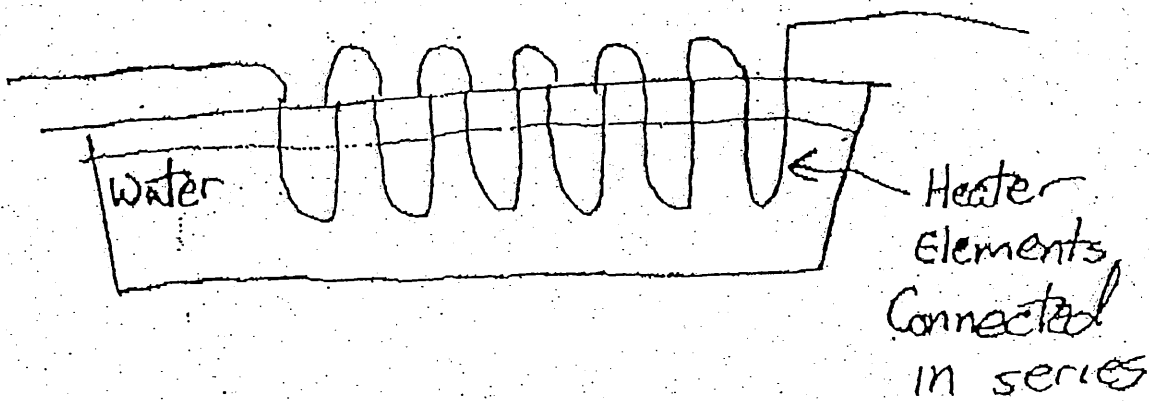
$$\text{Total Power} = \frac{(\text{Max})^2}{R_{\text{total}}}$$

At 100 Ω , and 2600 Volts, the total power
 $= \frac{2600^2}{100} = 67600 \text{ Watts}$

Note: The sum of the resistances must equal 100 ohms (Ω) and the sum of the power ratings for the resistors must equal 67600 W.
example 10-10 Ω resistors each rated at 6760 W

Note: Other states have used water heater elements or even light bulbs in series

example A 1500 watt water heater element has a resistance equal to 12.5 ohms. 10 in series will give a resistance of 125 ohms (approx.) and dissipate 15000 watts. (They must be water cooled)



PROCUREMENT REQUEST

Form: W. B. Williams Date: 4-13-94

Remarks: OC:11 obj:094

TCG: 42-20-000000

W. B. Williams et al

Please Order The Following:

Maint. Work Order No.

Person: Telephone:

Co.: Person: Telephone:

Co.: Person: Telephone:

Co.: Person: Telephone:

BID TAKEN BY: W. B. Williams

DATE BIDS TAKEN: 4-13-94

BIDS TAKEN BY: Open

PR No. 18052

4-13-94

NOTE: If individual items are to be awarded—circle low bidder in red

QUANTITY	UNIT	DESCRIPTION	PRICE	TOTAL	PRICE	TOTAL	PRICE	TOTAL	ACCOUNT NO.	DOCUMENT NO'S, ETC.
1	EA	1 Amp on Inductance	79.85	79.85	84.45	105.00			P.O. # 3860450	
		RSB								
1	EA	0mm Digital Multimeter	169.00	169.00	198.00	200.00				IO# 6
		HD153								
1	EA	Analog Multimeter	161.18	161.18	189.40	198.00				
		260-S								
1	EA	High Voltage Probe HV-44	99.00	99.00	120.00	135.00				
		IO# 620643069-			361150280-	62126462				
		01			19	00				
TOTALS			509.03	509.03	592.35	638.00				

For: OC:11

BID AWARDED BY: D. Moore

Approved:

Appr. Name: W. B. Williams Title: W. B. Williams

Entered On Top's: 4-13-94

Ordered: 4-13-94

Business Mgr. W. B. Williams Warden

CR-2030

White Copy - Supply Dept.
Pink Copy - Requesting Dept.

JAY WIECHERT MANUFACTURING

SPECIAL MACHINES - TOOLS - FIXTURES
INDUSTRIAL CONTROL SYSTEMS

719 SOUTH 10TH
FORT SMITH, ARKANSAS 72901

JAY WIECHERT, Owner
PROFESSIONAL ENGINEER

OFFICE 501 782-5587
FAX 501 782-2178
RES. 996-2554

RESUME

Jay Wiechert
719 So. 10TH
Ft. Smith, AR 72901

April 14, 1994

Birthdate: 6-28-43
Marital: Married and two daughters
Education: BSEE 1965 and MSEE 1967 Kansas State University
Licenses: Professional Engineer, AR #3731, AL #18455
Private Pilot, Commercial Drivers License.
Membership: Mensa, Soc. Mfg. Eng., AOPA, EAA.

EMPLOYMENT

<u>DATE</u>	<u>COMPANY</u>	<u>TITLE</u>	<u>COMMENTS</u>
7/73 to date	Jay Wiechert Manufacturing	Self-Employed	Design and fabricate Automatic Machinery for Manufacturing Plants.
9/72 to 8/73	General Electric Co. Louisville, KY	Design Eng. Home Laundry Engineering	Cost improvement projects, Automatic Washer and Dryer.
7/70 to 8/72	Whirlpool Corp. Ft. Smith, AR Gas Air Cond. Eng.	Development Engineer G.A.C. Eng.	Reliability improvement of Gas Air Conditioner. Responsible for electric motors and controls.
2/70 to 7/70	Whirlpool Corp. St. Joseph, Mich. Laundry Eng.	Project Eng. Compactor Eng.	Cost improvement of Trash Compactor. Design Motor, Transmission, Controls.
8/67 to 2/70	Whirlpool Corp. St. Joseph, Mich. Laundry Eng.	Engineer Dryer Div. Eng.	Development of new features and cost improvement projects on clothes dryer. Electrical controls and electronic dryness sensor design. Three Patents.
8/66 to 7/67	U.S. Government Ft. Riley, Kansas	Instructor	Electronic and math courses for Army, Part time employment while attending K.S.U.
6/64 to 7/66	Steel & Pipe Supply Manhattan, Kansas	Welder and Electrician	Steel Building Fabrication and Erection. Part time employment while attending K.S.U.

JAY WIECHERT MANUFACTURING

SPECIAL MACHINES - TOOLS - FIXTURES
INDUSTRIAL CONTROL SYSTEMS

719 SOUTH 10TH
FORT SMITH, ARKANSAS 72901

JAY WIECHERT, Owner
PROFESSIONAL ENGINEER

OFFICE 501 782-5587
FAX 501 782-2178
RES 501 7564

April 18, 1994

Admin. Assistant
Dept. of Corrections
Nashville, TN

Exec. on DPA

Dear Mr. 1:

I enjoyed talking with you today concerning your execution equipment.

The price for examining this equipment and writing report is twelve hundred and seventy dollars (\$1,270.00).

I would like to have one or more prison technical personnel present during testing. This will aid future problem-solving if required.

Quotation active for thirty days.

Sincerely yours,

Jay Wiechert
Jay Wiechert

*Box - Size of big case
Virginia - Chair
- Ky - Edleyville, Ky -*

Michael S. Morris, Ph.D.
 P.O. Box 710402
 San Diego, CA 92171-0402
 (619) 277-9135
 (619) 987-2397 cellular

April 18, 1994

State of Tennessee, Attorney General
 Attn: Glenn R. Pruden
 450 James Robertson Pkwy
 Nashville, TN 37219

RE: Rickman v. Dutton

Summary of Testing:

On Saturday, April 16, 1994 I visited the Riverbend Maximum Security Institution in Nashville, Tennessee for the purpose of examining the Tennessee electrocution system. During my visitation, I talked with Warden, Michael Dutton, members of the execution team, and also with Facilities Manager,

Prior to my arrival, I had outlined the testing equipment and setup that I wished to use while at the prison. Mr. [redacted] and I discussed these requirements at some length in the days preceding my visit. I requested that a resistive testload be established that would permit us to vary resistance from 400 ohms down to 150 ohms. (Resistance during the executions that I have studied ranged as low as 150 ohms and I felt that the system should be able to deliver appropriate currents at that low a resistance.) I posed several design scenarios for the resistive testload and Mr. [redacted] chose to use 1500 watt heater elements configured in series. Each element has a resistance of approximately 9.6 ohms and Mr. [redacted] configured 42 in series such that each was submerged in water to dissipate the heat produced. Mr. [redacted] also provided me with an analog multimeter, a digital multimeter, and an inductive ammeter.

Prior to my visit to the prison, I examined the operating manual for the electrocution system.

Upon my arrival in the death chamber, I did a visual inspection of the testbed and of the requested equipment. I found everything suitable. I also did an external visual examination of the electric chair and supporting hardware. I spoke with members of the execution team and Warden Dutton regarding procedures and protocols. The execution team demonstrated their practice procedure for me twice. I found their procedures and the frequency with which they practice

acceptable and comparable with the other states in which I have made similar observations.

I requested that the sponges to be used in an execution be soaked in saline and that the testbed be established as I had requested earlier in the week. A short length of pipe was placed over the sponge at the leg electrode. A wire was run from the pipe to the testload. A wire was run from the other end of the heating elements in series (comprising the testload) to a hemisphere that was clamped up against the soaked sponges in the headpiece. This completed the circuit. The inductive ammeter was set to the 15 Amp scale and clamped about the wire leading from the leg electrode to the testload. A digital multimeter was connected across one of the heater elements. That multimeter was set to record maximum voltage. (The total voltage drop would be equal to the voltage read from the multimeter multiplied by the number of elements in series.) A second digital multimeter was later connected across a second element and observed for changes in voltage during the cycle.

Initially, the system was tested briefly with all 42 elements in series. The resistance was measured to be 402 ohms. The maximum voltage drop observed across a single element was 55.5 volts (making the total voltage drop = 2331 volts). It was observed that upon activation of the system, the current peaked at approximately six amps then dropped to slightly over four amperes. This test was repeated several times with duplicate results. The meters on the equipment were observed to have similar readings to the meters that were attached at the testload.

The test was repeated with 40 elements in series. The measured resistance was 382 ohms. Peak voltage was measured at 56.3 volts across element (2252 volts total) and peak current was observed to be approximately 6 amperes with the current settling at slightly over 4 amperes.

The test was repeated with 38 elements in series. The measured resistance was 365 ohms. Each time the circuit was energized, it shutdown due to a blown circuit breaker.

The test was repeated with 39 elements in series. The measured resistance was 374 ohms. The circuit breaker shut the circuit off immediately upon starting the test.

The circuit was reconfigured for 40 elements in series. The equipment was run through its full cycle twice. Each time it performed the same. The circuit turned on at approximately 6.0 amperes and then dropped back fairly quickly to slightly over four amperes. The four ampere level was then maintained for the remainder of the cycle.

I saw no need to run further tests. I then discussed my results with Warden Dutton and Glen Pruden before I left the prison.

Conclusions:

The following conclusions were reached:

1. The execution team performed in a professional and consistent manner and should continue with their practice and preparation procedures.
2. The electrocution system for the state of Tennessee does not deliver adequate current and does not seem to have the capacity to function with a typical load for an execution.

Recommendations:

The following are the most significant recommendations with lesser recommendations and suggestions having been made verbally:

1. The procedures for each member of the execution team while well established and practiced should be written and provided to each member of the team to study. *Dutton*
2. The physical chair should be reinforced and strengthened to eliminate any sway or give. → 5/16
3. The volume of sponges used during the execution should be increased at the leg electrodes to be certain that there is no direct contact between the leg electrode and the leg. *B. Campbell 6/1/94*
4. Only one electrode should be used at the leg and it should be consistent with that used in other states (historically). USE AS IS PER (JAY WIECHERT)
5. All electrical connectors should be checked to be certain that they are rated appropriately. *Completed*
6. In the electrical box at the base of the chair, the wire with the grooved insulation should be replaced. No per *JAY WIECHERT*
7. The chair should be modified to be more conforming to the human form so that there is minimal free space between the inmate and the chair. *5/16/94 - Completed 5/16*
8. All metal to skin contact at any straps should be eliminated. *Sponges/leather (- 6/1/94)*
9. Strap placement should be evaluated for maximum Head Restraint stability and strength. *- Completed 6/1/94*
10. The electrical system should be modified to provide a voltage and current similar to that historically used in other states with a timing cycle that is also similar to that used historically. (A high voltage short duration cycle of 1800 - 2000 volts deliverable with typical currents of 7 - 12 amperes followed by a low voltage long duration cycle has been used.) I recommend the system in Virginia and also Alabama as good models. The system should be designed and to handle significantly greater currents than any worst case scenario such that shutdown or overload are not conceivable risks. The system should be able to operate with loads ranging as low as 100 ohms. The control electronics for the system should be minimal and have a

manual override that will operate even if the electronics fail to function properly. *--- Completed*

11. A test procedure should be established and well documented for the full electrical system. Testing should include verification of system meter readings using secondary Amperes and Voltage meters. A test load should be built that allows testing at a wide range of loads.


order
--- Volt meter
Test Rod

Range of TEST - WARDENS →
12. A member of the facilities staff (or an outside electrician) should be designated as responsible for understanding all details of system operation and repair and should be present at all testing and also during the setup to the conclusion of an execution. *Completed*

13. Adequate spare parts and backup equipment should be maintained and available at all times. *See #15 for ID.*

14. The system should include a chart recorder that clearly reads both current and voltage (as a function of time) as it is delivered to the chair.

NO - Can not be Completed with present system

- 15. (1) Spare fuses
 - (2) Fuse
 - (3) Keys
 - (4) 2 switches
- 

STATE OF TENNESSEE
OFFICE OF THE ATTORNEY GENERAL

CRIMINAL JUSTICE DIVISION

450 James Robertson Parkway
Nashville, Tennessee 37243-0493

Facsimile Transmission

DATE: 21 APR 94

Transmitting 6 pages, including this cover sheet

TO: WARDEN MICHAEL DUTTON

FAX Number: 350 - 3400

FROM: GLENN R. PRUDEN

Telephone Number: (615) 741-7070

Fax Reply Number: (615) 741-7327

Rush hand delivery to receiver

COMMENTS: CONFIDENTIAL - INVOLVES

PENDING LITIGATION

Michael S. Moras, Ph.D.
P.O. Box 710402
San Diego, CA 92171-0402
(619) 277-9135
(619) 987-2397 cellular

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Initially, the system was tested briefly with all 42 elements in series. The resistance was measured to be 402 ohms. The maximum voltage drop observed across a single element was 55.5 volts (making the total voltage drop = 2331 volts). It was observed that upon activation of the system, the current peaked at approximately six amps then dropped to slightly over four amperes. This test was repeated several times with duplicate results. The meters on the equipment were observed to have similar readings to the meters that were attached at the testload.

The test was repeated with 40 elements in series. The measured resistance was 382 ohms. Peak voltage was measured at 56.3 volts across element (2252 volts total) and peak current was observed to be approximately 6 amperes with the current settling at slightly over 4 amperes.

The test was repeated with 38 elements in series. The measured resistance was 365 ohms. Each time the circuit was energized, it shutdown due to a blown circuit breaker.

The test was repeated with 39 elements in series. The measured resistance was 374 ohms. The circuit breaker shut the circuit off immediately upon starting the test.

The circuit was reconfigured for 40 elements in series. The equipment was run through its full cycle twice. Each time it performed the same. The circuit turned on at approximately 6.0 amperes and then dropped back fairly quickly to slightly over four amperes. The four ampere level was then maintained for the remainder of the cycle.

I saw no need to run further tests. I then discussed my results with Warden Dutton and Glen Pruden before I left the prison.

20-1994 05-19

LSU BOOKSTORE

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2. The electrocution system for the state of Tennessee does not deliver adequate current and does not seem to have the capacity to function with a typical load for an execution.

Recommendations:

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3. The volume of sponges used during the execution should be increased at the leg electrodes to be certain that there is no direct contact between the leg electrode and the leg.
4. Only one electrode should be used at the leg and it should be consistent with that used in other states (historically).
5. All electrical connectors should be checked to be certain that they are rated appropriately.
6. In the electrical box at the base of the chair, the wire with the grooved insulation should be replaced.
7. The chair should be modified to be more conforming to the human form so that there is minimal free space between the inmate and the chair.
8. All metal to skin contact at any straps should be eliminated.
9. Strap placement should be evaluated for maximum stability and strength.
10. The electrical system should be modified to provide a voltage and current similar to that historically used in other states with a timing cycle that is also similar to that used historically. (A high voltage short duration cycle of 1800 - 2000 volts deliverable with typical currents of 7 - 12 amperes followed by a low voltage long duration cycle has been used.) I recommend the system in Virginia and also Alabama as good models. The system should be designed and to handle significantly greater currents than any worst case scenario such that shutdown or overload are not conceivable risks. The system should be able to operate with loads ranging as low as 100 ohms. The control electronics for the system should be minimal and have a

manual override that will operate even if the electronics fail to function properly.

11. A test procedure should be established and well documented for the full electrical system. Testing should include verification of system meter readings using secondary Ampere and Voltage meters. A test load should be built that allows testing at a wide range of loads.

12. A member of the facilities staff (or an outside electrician) should be designated as responsible for understanding all details of system operation and repair and should be present at all testing and also during the setup to the conclusion of an execution.

13. Adequate spare parts and backup equipment should be maintained and available at all times.

14. The system should include a chart recorder that clearly reads both current and voltage (as a function of time) as it is delivered to the chair.

PROUREMENT REQUEST

BIDS TAKEN FROM

From: Maintenance Date: 4-26-94

Remarks:

PAGE 1 of 2

Obj: 094

Maint. Work Order No.

Please Order The Following:

QUANTITY	UNIT	DESCRIPTION	PRICE	TOTAL	PRICE	TOTAL	PRICE	TOTAL	ACCOUNT NO.	DOCUMENT NO'S, ETC.
1	EA	2 Pole 100 Amp discrimet fuses	86.36	86.36					P.O.# 3869995	
		# GEN-423M								
6	EA	100 Amp FRNR100-250 Volt	8.96	53.76						IO#-
1	ea	fuse	6.67	6.67						
		6x6x6 JCR BOX								
2	ea	LR #932	4.12	8.24						
2	ea	cover plate	1.17	2.34						
1	ea	LL # 37	2.73	2.73						
1	ea	cover plate	2.15	2.15						
2	ea	10' 1" Thimwell conduit	3.72	7.44						
TOTALS										

BID AWARDED BY

Entered On TOPS 4-26-94

Approved:

Applicant Name

Title

W/Huber 4-26-94 ordered

Business Mgr. [Signature]

White Copy - Supply Dept.
Pink Copy - Requesting Dept.
Canary Copy - Treasr Copy

2:34 pm

Sent To Print Callie C

CR-2030

Warden

Person: _____ Telephone: _____
 Co.: _____
 Person: _____ Telephone: _____
 Co.: _____
 Person: _____ Telephone: _____

PR No. 18130
4-26-94
 DATE BIDS TAKEN
 BIDS TAKEN BY [Signature]
 NOTE: If individual items are to be awarded—circle low bidder in red

INNOVATION CENTER REQUEST

BIDS TAKEN FROM

Date: 4-27-94

Remarks:

OC: 11
 PAGE 2 of 2
 Obj: 094

OC: 142-20-00000
 Main Work
 Order No.

Please Order The Following:

QUANTITY	UNIT	DESCRIPTION	PRICE	TOTAL	PRICE	TOTAL	PRICE	TOTAL	ACCOUNT NO.	DOCUMENT NOS. ETC.
4	BX	6/32's 3" screws	3.15	12.60						
10	ea	1" Thinwall Straps	1.00	10.00						
TOTALS				182.29						

BID AWARDED BY

Entered On TOPS 4-26-94

Ordered 4-26-94

Sent To Print [Signature]

PR No. 18130

DATE BIDS TAKEN

BIDS TAKEN BY

NOTE: If individual items are to be awarded—circle low bidder in red

P.O.# 386995

IO#

Approved:

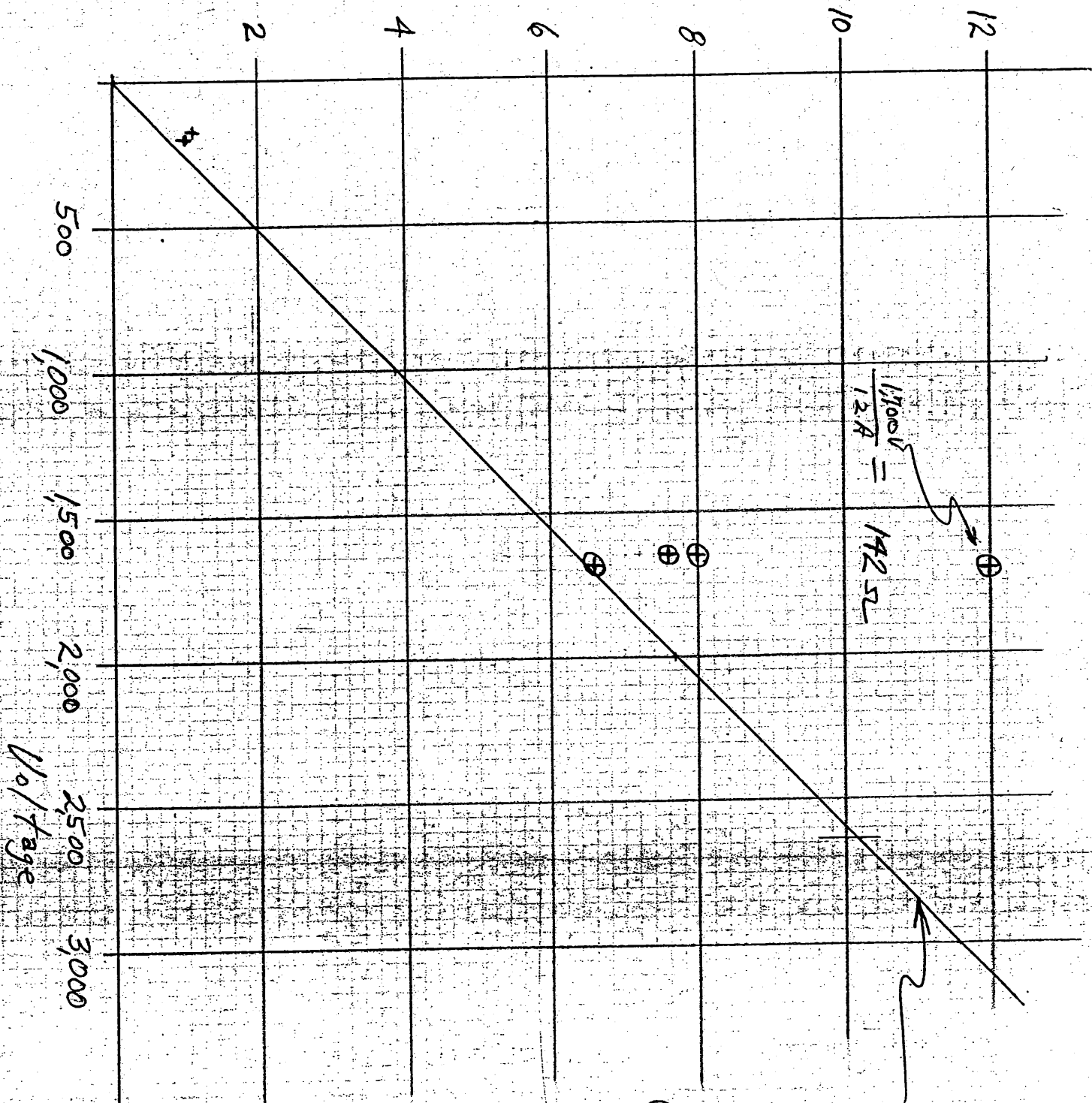
Business Mgr.

Warden

CR-2030

For: _____ Name _____ Title _____
 Appr.: _____ Name _____ Title _____
 White Copy — Supply Dept.
 Pink Copy — Requesting Dept.
 Canary Copy — Tracer Copy

Current - Amps



4-23-94

Test Unit
R ≈ 260Ω

⊕ Actual / Executions

Jay Wheeler
Ft. Smith, Ark
501 782-5587

10/7age

JAY WIECHERT MANUFACTURING

SPECIAL MACHINES - TOOLS - FIXTURES
INDUSTRIAL CONTROL SYSTEMS

719 SOUTH 10TH

FORT SMITH, ARKANSAS 72901

OFFICE 501 782-3387
FAX 501 782-8178
RES 990 2954

JAY WIECHERT, Owner
PROFESSIONAL ENGINEER

April 27, 1994

Mr. Bobby Campbell
Dept. of Correction-Tenn.
7475 Cockrill Bend Ind. Rd.
Nashville, TN 37209

Subj: Examination and redesign of execution equipment on April 25, 1994

Dear Mr. Bobby Campbell:

Thank you for your hospitality during my visit.

As you observed, the system malfunctioned during our initial test using a 260 ohm load (equivalent to light weight inmate). All three of the ganged panel-mounted circuit breakers tripped with the connecting pin removed.

After bypassing the three circuit breakers, the equipment survived the programmed cycle and delivered approximately four and one-half amps.

This current of four and one-half amps is historically too low and thus the regulation circuitry of the power supply was modified. The current transformer (donut) which monitors output current original had nineteen turns of high-voltage cable. This was changed to eleven turns. The resulting current measured thru the 260 ohm load was 7.4 amps (the measured voltage was 1,920 VAC). The primary circuit parameters were measured at 188 VAC and 100 amps.

The system was tested using 5 gallons of water with $\frac{1}{2}$ teaspoon salt. Initial cycle observation was 7.5 amp with 1,400 VAC. Second cycle observation was 7.8 amp with 1,100 VAC.

The system was tested using 1 teaspoon of salt. Initial observation was 8 amp with 750 VAC. Second cycle observation was 8 amp with 600 VAC.

The original cycle was 60 seconds ON (T2), 15 seconds OFF (T3), and 60 seconds ON (T4). This was changed to 45 seconds ON, 15 seconds OFF, and 45 seconds ON.

JAY WIECHERT MANUFACTURING

SPECIAL MACHINES - TOOLS - FIXTURES

INDUSTRIAL CONTROL SYSTEMS

719 SOUTH 10TH

FORT SMITH, ARKANSAS 72901

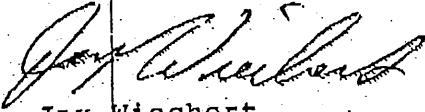
JAY WIECHERT, Owner
PROFESSIONAL ENGINEER

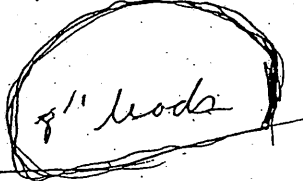
OFFICE 501 782 6567
FAX 501 782-2178
RFS. 999 2354

I suggest the following modifications:

- A. The brass ankle electrodes should be larger (flare at the front).
- B. Use natural sea sponges, at least $\frac{1}{2}$ inch thick (head and ankles).
- C. The 100 Amp breakers in the back room must be removed from the primary circuit. Use 100 amp, 2 pole fused disconnect switch with Bussman FRN-R100 fuses.
- D. Move the power supply cabinet from the utility room to the executioners room. Position next to the control console so that executioner may view ammeter.
- E. Mount 100 Amp fused disconnect switch (with FRN-R80 fuses) on wall near the power supply. This switch is our primary safety device and must be locked in the "off" position except when performing an execution. This switch must be "off" when personnel are connecting leads.
- F. Remove and discard the 100 Amp non-fused disconnect switch from the utility room wall. Run conduit and 208 VAC wiring from the floor of utility room to the disconnect switch (see E. above) in the executioners room. Connect the bottom side of the switch to the power supply.
- G. Replace ammeter in power supply cabinet. New meter (to be supplied by Jay Wiechert) will have 15 Amp scale.

Sincerely yours,


Jay Wiechert


3/4" leads

JAY WIECHERT MANUFACTURING

SPECIAL MACHINES - TOOLS - FIXTURES
INDUSTRIAL CONTROL SYSTEMS

719 SOUTH 10TH
FORT SMITH, ARKANSAS 72901

Comptel

JAY WIECHERT, Owner
PROFESSIONAL ENGINEER

OFFICE 501 782-5587
FAX 501 782-2178
RES. 996-2554

May 1, 1994

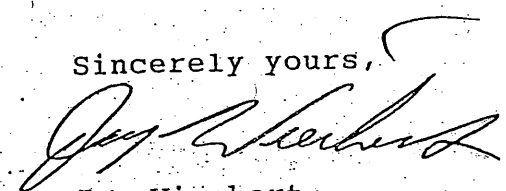
Mr. Michael Dutton, Warden
Riverbend Maximum Security Institution
7475 Cockrill Bend Ind. Rd.
Nashville, TN 37209

Dear Warden Dutton:

I have examined the Execution Equipment at this location and find that it is operating correctly.

Various electrical loads (100 ohms to 260 ohms) have been connected to the high voltage leads at the chair location. These loads simulate a broad range of inmate physique. The measured voltage and current during testing will properly execute an inmate.

Sincerely yours,



Jay Wiechert

PE #3731

JAY WIECHERT MANUFACTURING

719 SOUTH 10TH

FORT SMITH, ARKANSAS 72901

PHONE 501 782-5587

DEPT. OF CORRECTION

Riverbend Maximum Security Inst.

7475 Cockrill Bend Ind. Rd.

Nashville, TN 37209

DATE May 1, 1994

CUSTOMER P.O.# Verbal

DATE SHIPPED May 1, 1994

TERMS Net 30

QUANTITY	DESCRIPTION	PRICE
2	TRIP (Test and modify execution equipment)	
	\$1,270.00/each	\$2,540.00
1	AMMETER	\$ 85.00
	TOTAL AMOUNT DUE:	\$2,625.00
	Requested by: Mr. Bobby Campbell	
	<i>OK/B. Campbell 5.1.94</i>	

JAY WIECHERT MANUFACTURING

719 SOUTH 10TH

FORT SMITH, ARKANSAS 72901

PHONE 501 782-5587

71-0454045⁹

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DEPT. OF CORRECTION
Riverbend Maximum Security Inst.
7475 Cockrill Bend Ind. Rd.
Nashville, TN 37209

DATE May 1, 1994

CUSTOMER P.O.# Verbal

DATE SHIPPED May 1, 1994

TERMS Net 30

QUANTITY	DESCRIPTION	PRICE																
2	TRIP (Test and modify execution equipment)																	
	\$1,270.00/each	\$2,540.00																
1	AMMETER	\$ 85.00																
	TOTAL AMOUNT DUE:	\$2,625.00																
W# 3525422 5/25/94																		
Requested by: Mr. Bobby Campbell																		
71-0454095 00																		
<table border="1" style="width: 100%;"> <tr> <td>BATCH DATE</td> <td>BATCH #</td> </tr> <tr> <td>5-6-94</td> <td>001</td> </tr> <tr> <td>TC</td> <td>CC</td> </tr> <tr> <td>102</td> <td>10</td> </tr> <tr> <td>VOUCHER #</td> <td>DOC REF #</td> </tr> <tr> <td>2952</td> <td>DP4007590</td> </tr> <tr> <td>DUE DATE</td> <td>AMOUNT</td> </tr> <tr> <td>6-5-94</td> <td>2,625.00</td> </tr> </table>			BATCH DATE	BATCH #	5-6-94	001	TC	CC	102	10	VOUCHER #	DOC REF #	2952	DP4007590	DUE DATE	AMOUNT	6-5-94	2,625.00
BATCH DATE	BATCH #																	
5-6-94	001																	
TC	CC																	
102	10																	
VOUCHER #	DOC REF #																	
2952	DP4007590																	
DUE DATE	AMOUNT																	
6-5-94	2,625.00																	
RIVERBEND MAXIMUM SECURITY INSTITUTION MAY 3 1994 BUSINESS OFFICE																		

JAY WIECHERT MANUFACTURING

SPECIAL MACHINES - TOOLS - FIXTURES
INDUSTRIAL CONTROL SYSTEMS

178 SOUTH 10TH

FORT SMITH, ARKANSAS 72901

JAY WIECHERT, Owner
PROFESSIONAL ENGINEER

OFFICE 501 782-5507
FAX 501 782-2176
HLS. 986-2554

May 2, 1994

Mr. Bobby Campbell
Dept. of Correction
7475 Cockrill Bend Ind. Rd.
Nashville, TN 37209

Subject: Examination of execution equipment on May 1, 1994.

Dear Mr. Bobby Campbell:

Thank you for completing the modifications enumerated in my letter of April 27, 1994. Good workmanship. Having the fused disconnect switch, power supply, and console together in the executioners room will improve safety.

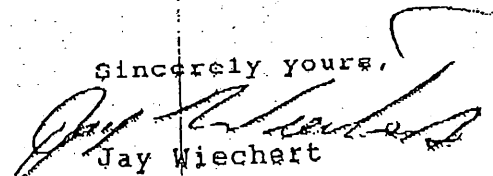
As you observed, we installed the new 15 amp meter in the power supply cabinet. We mounted a metal shield behind the meter due to the high magnetic flux within the cabinet.

The wiring within the control console was modified to eliminate the "Test" feature. This was done to prevent energizing the system inadvertently when moving the key switch to the "off" position.

The measured current using my test box (approx. 260 ohm) was 7.4 amps. The measured current using your water-heater elements (21 element yields approx. 200 ohms) was 7.6 amps. Using seven elements (approx. 63 ohms) we measured 8 amps.

I have communicated this information to Dr. Michael Morse as requested.

Sincerely yours,


Jay Wiechert

State of Tennessee



Department of Correction
Division of Adult Institutions

Riverbend Maximum Security Institution
7475 Cockrill Bend Industrial Road
Nashville, Tennessee 37243-0471
615-350-3100

MEMORANDUM

TO: Bill Hutcherson, Legal Council
FROM: Bobby Campbell, Associate Warden/Administration
DATE: November 10, 1994
SUBJECT: Information Requested by The Capital Case Resource Center

I am enclosing the material which Capital Case Resources requested pertaining to servicing and maintenance of the electric chair. I did not include the original purchase of the chair because I have been informed that Capital Case Resources already has this material.

Since these documents may be somewhat confusing I am outlining the process which occurred last spring.

- 1) Glen Pruden from the State Attorney General's Office contacted us about a Doctor Michael Morse coming to inspect the electric chair. I believe the Attorney General's Office paid him.
- 2) Dr. Morse came to this institution and inspected the electric chair and made several recommendations (see attached). He also recommended Mr. Jay Wiechert, an electrical engineer from Arkansas.
- 3) Mr. Wiechert came to this institution in late April and inspected the chair. He made several recommendations as to the fuse boxes and wiring leading up to the computer which activates the electric chair.
- 4) His recommendations were carried out by our maintenance department (see attached letter from Mr. Wiechert) to his satisfaction.
- 5) Mr. Wiechert made some modifications to the wiring of the power source and the computer.

Re: Information Requested by The Capital Case Resource Center

- 6) He did extensive testing and wrote us a letter stating that the electric chair would do the job it was intended to do (see attached letter).

We have not conducted any further tests since Mr. Wiechert left. We do have the test equipment that was recommended by Mr. Wiechert and Dr. Morse which is a series of water heater elements hooked together. The resistance can be varied as desired. Any further tests done by our maintenance department will utilize this equipment.

I hope this satisfies their request. If not, please let me know.

B. Campbell

Bobby Campbell, AWA

BC:dg

enclosure

2-2-95

Post-It™ brand fax transmittal memo 7671		# of pages ▶	
To	Fred Hix	From	B. Campbell
Co.	Correction	Co.	R.M.S.I.
Dept.		Phone #	
Fax #	741-4605	Fax #	350-3400

To: Fred Hix, Budget Director
 From: B. Campbell, AWA
 Subj: COST of ELECTROCUTION

ATTACHED IS A WORKSHEET done by WARDEN DUTTON FOR A PRESENTATION TO MEMBERS OF THE LEGISLATURE - HIS TOTAL IS \$6940.12

YESTERDAY I DID SOME FIGURES AND CAME UP WITH ~~\$6502.00~~ \$6502.00, SO WE ARE IN SOME BALLPARK -

IT APPEARS THAT HIS FIGURES ARE BASED ON SALARIES. MINE ARE BASED ON FOLLOWING:

Pay for Officers:	\$4402
Doctor	500
Executioner	500
Ambulance	200
TENT RENTAL	300
Telephones	500
Electricity, Heater, lights	100
	<u>\$6502.00</u>

OFFICERS, INCLUDING SENTRY OFFICERS, AND TO MAN DEATH WATCH, CROWD CONTROL, MEDIA CONTROL. OUR PLAN IS TO HAVE A LARGE TENT IN THE PARKING LOT WITH GENERATOR POWERED LIGHTS & HEATER IF NECESSARY FOR THE MEDIA. ALSO TELEPHONES -

B. Campbell

BASIC	EXEC	SG (8 HR)	
1567	2-LT	(71.23 x 2 = 142.46)	Total 6 380.56 1061.00 \$1,441.56 ✓
1444	2-SGT	(65.64 x 2 = 131.28)	
1175	2-CO	(53.41 x 2 = 106.82)	
3089 8HR	1-W	140.40	\$1,441.56 ✓
2291	1-AWO	104.14	
2203	1-AWA	100.14	
1384	1-AA	62.91	
1931	1-FAC MGR	87.77	
1444	1-FAC SUPV	65.64	
500	1-EXEC	500.00	
		<u>1061.00</u> ✓	

SHIFT (12-HR SHIFT) (x2)				
1567	1-LT	142.46	841.76	284.92 @ 3 days 1139.63
1444	1-SGT	132.28	773.68	264.56 1058.29
1175	3-CO	160.23	961.38	320.46 1281.84
			<u>2609.83</u>	\$3479.8

ds () (x) 3				
1275	2-CPL	347.70	(57.95 x 2 x 3)	463.60 3079.28
1175	6-CO	961.38 570.46	(53.41 x 3)	256.31 68
		668.75	1309.08	

5338.78
1601.34
6940.12
Base Pay

JAY WIECHERT MANUFACTURING

SPECIAL MACHINES - TOOLS - FIXTURES
INDUSTRIAL CONTROL SYSTEMS

719 SOUTH 10TH
FORT SMITH, ARKANSAS 72901

OFFICE 501 782-5587
FAX 501 782-2178
RES. 996-2554

JAY WIECHERT, Owner
PROFESSIONAL ENGINEER

October 9, 1995

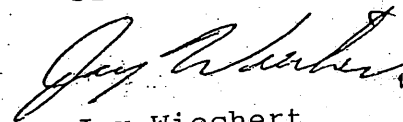
Mr. Ricky J. Bell, Warden
Riverbend Maximum Security Institution
7475 Cockrill Bend Ind. Rd.
Nashville, TN 37243-0471

Dear Warden Bell:

I have examined the Execution Equipment at this location
on October 6, 1995 and find that it is operating correctly.

Electrical loads (simulating a human being) were connected
to the high voltage leads at the chair location. The measured
voltage and current observed during testing will properly
execute an inmate.

Sincerely yours,



Jay Wiechert

P.E. #3731

RECEIVED

OCT 13 1995

RIVERBEND MAXIMUM
SECURITY INSTITUTION
OFFICE OF WARDEN

State of Tennessee



Department of Correction
Division of Adult Institutions

Riverbend Maximum Security Institution
7475 Cockrill Bend Industrial Road
Nashville, Tennessee 37243-0471
615-350-3100

October 25, 1995

Jay Wiechert
719 South 10th
Fort Smith, Arkansas 72901

Dear Jay:

I am enclosing a manual which was given to us by Fred Leuchter when he sold us the electricution system. This document has been submitted to the court. It would be very helpful to us if you would make the necessary changes to this document and provide us a new manual with a cover sheet with your name and company for a title page:

Jay, needless to say, this information is strictly confidential. Please return the new manual to me along with your invoice for this service.

Thanks very much for all your help.

Sincerely,

B. Campbell
Bobby Campbell
Associate Warden for Administration

BC:dg

enclosure

JAY WIECHERT MANUFACTURING

SPECIAL MACHINES - TOOLS - FIXTURES
INDUSTRIAL CONTROL SYSTEMS

719 SOUTH 10TH
FORT SMITH, ARKANSAS 72901

OFFICE 501 782-5587
FAX 501 782-2178
RES. 996-2554

JAY WIECHERT, Owner
PROFESSIONAL ENGINEER

January 26, 1996

Mr. Bobby Campbell
Associate Warden for Administration
Riverbend Maximum Security Institution
Nashville, TN 37243-0471

Dear Mr. Bobby Campbell:

The following modifications have been made to the Electrocution System built for the State of Tennessee by Fred A. Leuchter Associates, Inc. These modifications were made by Jay Wiechert and by the technical personnel at Riverbend Maximum Security Institution. Work performed by Riverbend employees was examined and approved by Jay Wiechert.

- A. Components of Electrocution System were consolidated in Executioners Room. Modular Power Supply with meters was moved from utility room. Fused Disconnect Switch was mounted on wall near power supply in Executioners Room.
- B. Circuit Breaker (CB3) in Modular Power Supply Cabinet was eliminated because normal execution current exceeds device rating and would cause unwanted shut-down of system. Circuit is now protected by fuses (incoming power).
- C. The Current Regulation Circuitry was modified to permit more amperes to flow during an execution. Original design limited the current flow to four and one-half amps. Circuit was modified to allow eight amps of current which is consistent with electrocution history. This was accomplished by modifying the existing monitoring circuitry. Originally the current transformer in the monitoring circuit had nineteen turns of high voltage cable. This was changed to eleven turns.

JAY WIECHERT MANUFACTURING

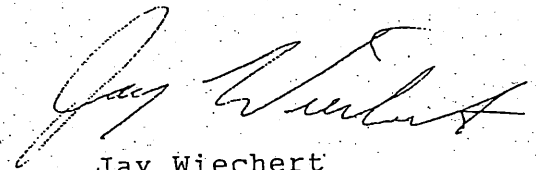
SPECIAL MACHINES - TOOLS - FIXTURES
INDUSTRIAL CONTROL SYSTEMS

719 SOUTH 10TH
FORT SMITH, ARKANSAS 72901

OFFICE 501 782-5587
FAX 501 782-2178
RES. 996-2554

JAY WIECHERT, Owner
PROFESSIONAL ENGINEER

- D. Ammeter in Power Supply Cabinet was changed to reflect new amperage capability. Full scale is now fifteen amps. Shielding of back-side of meter was added to increase accuracy. Meter is now within view of executioner (see A. above).
- E. The wiring within the Control Console was modified to eliminate the "Test" feature. This was done to prevent energizing the system inadvertently when moving the key switch from the "operate" position to the "off" position.
- F. The automatic timing cycle was adjusted as follows: Originally, the system was energized for two periods of one minute each with a pause of ten or fifteen seconds between. This was changed to 45 seconds ON, 15 seconds OFF, and then 45 seconds ON. The electrical energy provided by this cycle is consistent with other modern execution equipment.



Jay Wiechert
PE #3731

Wellsboro Industrial Park
PO Box 636
Wellsboro, PA 16901
717-724-7553 FAX-7989



CUSTOM
MACHINERY
GROUP

ENGINEERS AND BUILDERS OF CUSTOM MACHINERY

April 23, 1996

Mr. Bobby Campbell
Associate Warden for Administration
Riverbend Maximum Security Institution
Nashville, TN 37243-0471

Dear Warden Campbell,

Please be advised that JVM Industries, Inc. has acquired the design drawings and all rights to the Execution Technology of Fred A. Leuchter, Associates, Inc. of Boston, Massachusetts.

JVM Industries assumes all guarantees on Leuchter designed and installed equipment throughout the country including your Modular Electrocution System at Riverbend.

However, it has come to our attention that certain improper and unsound modifications have been made to Leuchter's original equipment by the Wiechert Company of Fort Smith Arkansas per the enclosed letter.

We are of the opinion these modifications, particularly (c) and (f) are dangerous and inconsistent with proper Execution Technology and Procedure. These modifications may result in 'tissue cooking' of the executee and further, fibrillation of the executees heart resulting in failure to execute and a brain dead vegetable at the conclusion of the execution procedure.

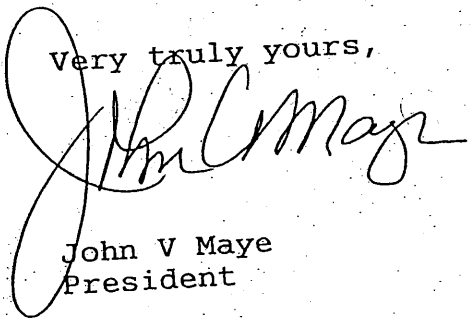
Please be advised the Wiechert modifications void the Leuchter guarantee JVM has assumed. In addition it places the State of Tennessee at risk in terms of failing to properly execute. in the event of the use of said system.

We bear no legal liability in this matter except to advise you of these conditions and the possibility of torture of the inmate if an execution is carried out with the modified equipment.

Please advise if the Wiechert modifications were in fact carried out on the Leuchter equipment at Riverbend and, if they in fact were, whether you intend to make the necessary changes to restore the equipment to proper operating order, thus reinstating your guarantee and preventing your system from becoming an instrument of torture.

I await your reply on this matter.

Very truly yours,



John V Maye
President

cc: Commissioner of Correction
Warden, Riverbend Maximum Security Institution

enc.



CUSTOM
MACHINERY
GROUP

ENGINEERS AND BUILDERS OF CUSTOM MACHINERY



Department of Correction
Division of Adult Institutions

Riverbend Maximum Security Institution
7475 Cockrill Bend Industrial Road
Nashville, Tennessee 37243-0471

MEMORANDUM

TO: Bill Hutcherson, Legal Counsel
FROM: Ricky J. Bell, Warden
DATE: May 7, 1996
RE: Execution Equipment

Correspondence has been received from JVM Industries, Inc., Wellsboro, PA, which indicates that the modifications made by the Wiechert Company to the electric chair system are unsound.

As you will note by the enclosed documents, modifications were made to the execution equipment after it was inspected by Michael S. Morse, Ph.D., and Jay Wiechert of Wiechert Manufacturing.

Your review and guidance in this matter will be appreciated.

Ricky J. Bell, Warden

RJB/md
Enclosures



STATE OF TENNESSEE
DEPARTMENT OF CORRECTION
4TH FLOOR RACHEL JACKSON BLDG.
320 SIXTH AVENUE NORTH
NASHVILLE, TENNESSEE 37243-0465

September 11, 1996

Ricky Bell, Warden
Riverbend Maximum Security Institution
7475 Cockrill Bend Road
Nashville, TN 37243-0471

RE: Electrocutation System

Dear Warden Bell:

This office has reviewed the April 23, 1996, letter from JVM Custom Machinery Group concerning the electrocutation system at Riverbend. Based upon the review by Dr. Michael S. Morse in 1994, in relation to the Rickman v. Dutton litigation and his recommended modifications to the electrocutation system performed by Jay Wiechert Manufacturing, the system would appear to be in proper working order. JVM Custom Machinery Groups's assertions in its letter of possible problems concerning the use of the electrocutation system appear to be inconsistent with the recommendations provided by the experts utilized to physically examine the system.

I would recommend that JVM be requested to provide specific documentation to support its assertions that the system will not function as expected and refute the recommended modifications of Dr. Morse and Mr. Wiechert.

Sincerely,

A handwritten signature in black ink, appearing to read "W. B. Hutcherson, Jr.", with a long horizontal flourish extending to the right.

William B. Hutcherson, Jr.
Staff Counsel



Department of Correction
Division of Adult Institutions

Riverbend Maximum Security Institution
7475 Cockrill Bend Industrial Road
Nashville, Tennessee 37243-0471

September 23, 1996

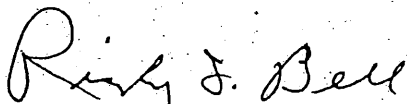
John V. Maye, President
JVM Industries, Inc.
Wellsboro Industrial Park
P. O. Box 636
Wellsboro, PA 16901

Dear Mr. Maye:

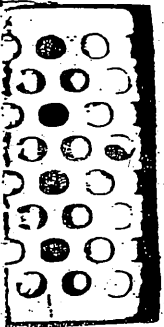
My office is in receipt of your letter to Bobby Campbell dated April 23, 1996. In your letter you make several assertions of possible problems concerning the use of the electrocution system at Riverbend. Your comments appear to be inconsistent with the recommendations provided by the experts utilized to physically examine the system.

JVM is requested to provide specific documentation to support its assertions that the system will not function as expected, and further, to refute the modifications recommended by Dr. Michael S. Morse and performed by Joy Wiechert.

Sincerely,


Ricky J. Bell, Warden

RJB/md



EDDIE WARNER, INC.

521A Eighth Ave. So.
Nashville, TN 37203

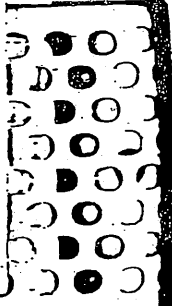
Phone (615) 254-1224 • Fax (615) 254-1227



INVOICE

No. 83710

6/14



TO: 047375 TE
STATE OF TENNESSEE
RIVERBEND MAXIMUM SECUR
7575 COCKRILL BEND RD
NASHVILLE TN 37209

INVOICE DATE	5-14-97	SALESPERSON
SHIP TO:		

ALL CLAIMS AND RETURNED GOODS MUST BE ACCOMPANIED BY THIS BILL

YOUR ORDER NO.	DATE SHIPPED	SHIPPED VIA	DESCRIPTION	F.O.B. POINT	TERMS	UNITS PRICE	TOTAL	
27293								
1	11/24/7		COLOR CCD BOARD CAM			229.00		
200	2/22		SHIMAZO CD			10	2000	
2	2/22		2cm metal rule			176	176	
							229.00	
							250.76	

BATCH DATE: []

WORK ORDER NO.: []

QC: []

INSTRUMENT NO.: []

DATE: []

DUPLICATE: []

AMOUNT: 250.76

5859207

SECURITY INSTITUTION

JUN 4 1997

BUSINESS OFFICE

Handwritten signature

JAY WIECHERT MANUFACTURING

SPECIAL MACHINES - TOOLS - FIXTURES
INDUSTRIAL CONTROL SYSTEMS

719 SOUTH 10TH
FORT SMITH, ARKANSAS 72901

WIECHERT, Owner
PROFESSIONAL ENGINEER

OFFICE 501 782-5567
FAX 501 782-2178
RES. 906-2554

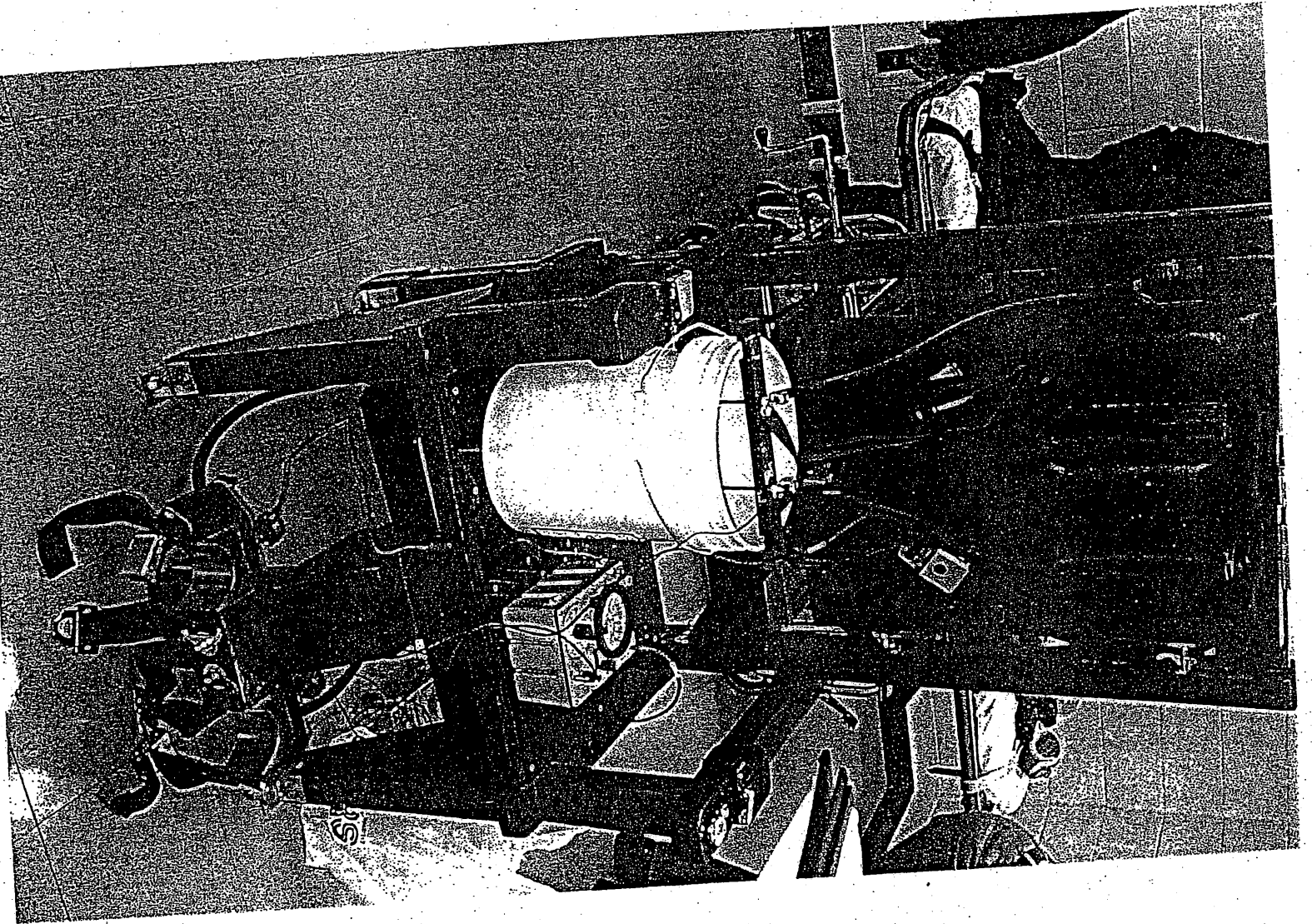
RESUME

Jay Wiechert
719 So. 10th
Ft. Smith, AR 72901

July 22, 1999

Birthdate: 6-28-43
Marital: Married and two daughters
Education: BSEE 1965 and MSEE 1967 Kansas State University
Licenses: Professional Engineer, AR #3731
Private Pilot, Commercial Drivers License.
Membership: Mensa, AOPA, EAA.

<u>DATE</u>	<u>COMPANY</u>	<u>EMPLOYMENT TITLE</u>	<u>COMMENTS</u>
73 to Date	Jay Wiechert Manufacturing	Self-Employed	Design and fabricate Automatic Machinery for Manufacturers.
72 to 8/73	General Electric Louisville, KY	Design Eng. Home Laundry Engineering	Cost improvement projects, Automatic Washer and Dryer.
70 to 8/72	Whirlpool Corp. Ft. Smith, AR Gas Air Cond. Eng.	Development Engineer G.A.C. Eng.	Reliability improvement of Gas Air Conditioner. Responsible for electric motors and controls.
70 to 7/70	Whirlpool Corp. St. Joseph, Mich. Laundry Eng.	Project Eng. Compactor Eng.	Cost improvement of Trash Compactor. Design Motor, Transmission, Controls.
67 to 2/70	Whirlpool Corp. St. Joseph, Mich. Laundry Eng.	Engineer Dryer Div. Eng.	Development of new features and cost improvement projects on clothes dryer. Electrical controls and electronic dryness sensor design. Three Patents.
66 to 7/67	U.S. Government Ft. Riley, Kansas	Instructor	Electronic and math courses for Army, Part time employment while attending K.S.U.
64 to 7/66	Steel & Pipe Supply Manhattan, Kansas	Welder and Electrician	Steel Building Fabrication and Erection. Part time employment While attending K.S.U.



JAY WIECHERT MANUFACTURING

SPECIAL MACHINES - TOOLS - FIXTURES

INDUSTRIAL CONTROL SYSTEMS

719 SOUTH 10TH

FORT SMITH, ARKANSAS 72901

JAY WIECHERT, Owner
PROFESSIONAL ENGINEEROFFICE 501 782-5587
FAX 501 782-2178
RES. 800-2554

Feb. 7, 2000

Mr. Ricky J. Bell, Warden
Riverbend Maximum Security Institution
7475 Cockrill Bend Ind. Road
Nashville, TN 37243-0471

Dear Warden Bell:

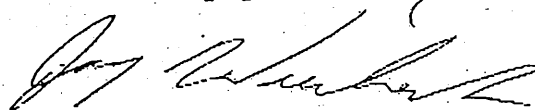
I tested your Execution Equipment during October 1995. At that time the equipment was operating properly. I used various electrical loads during this testing (including a test box of my design which simulates a typical inmate).

I will loan this test box to you at no charge, if your technical personnel want to do the testing.

If you want me to test the equipment, the price is twelve hundred and seventy dollars (\$1,270.00).

Thank you.

Sincerely yours,



Jay Wiechert

JAY WIECHERT MANUFACTURING

SPECIAL MACHINES - TOOLS - FIXTURES
INDUSTRIAL CONTROL SYSTEMS

719 SOUTH 10TH
FORT SMITH, ARKANSAS 72901

JAY WIECHERT, Owner
PROFESSIONAL ENGINEER

OFFICE 501 782-5587
FAX 501 782-2178
RES. 996-2554

TN

2-16-2000

7 Elements $35.4 \Omega \Rightarrow 247.8 \Omega$
(Measures 247Ω)

$$\frac{481 \text{ VAC}}{2 \text{ Amp}} = 240.5 \Omega \text{ measured}$$

Changes # 4E269 # 43⁸⁵

$$R = \frac{(240 \text{ VAC})^2}{1550 \text{ Watts}} = 37.16 \Omega \text{ Hol}$$

$$7 \times 37.16 \Omega = 260 \Omega$$

$$\frac{240 \text{ VAC}}{37.16 \Omega} = 6.46 \text{ Amps}$$

JAY WIECHERT MANUFACTURING

719 SOUTH 10TH

FORT SMITH, ARKANSAS 72901

PHONE 501 782-5587

S
O
L
D
T
O

DATE Feb. 17, 2000

Riverbend Maximum Security Instituion

7475 Cockrill Bend Ind. Road

Nashville, TN 37243-0471

CUSTOMER P.O.# verbal

DATE SHIPPED Feb. 17, 2000

TERMS Net 30

QUANTITY	DESCRIPTION	PRICE
	Test Execution Equipment	\$1,270.00
	Requested by Warden Ricky Bell	
	<i>Received 2/17/2000</i> <i>Ricky J. Bell</i>	

INVOICE

TN

2-17-2000

10:35

205 VAC @ Knife Sw

1st test
top

1st

Test

1900 VAC

(Military meter)

7 1/2 Amp

(Analog)

2850 VAC open ckt

Panel
meters

2050 VAC

(adjusted after reading)

Start at 7.8 Amp

Finish 7.3 Amp

Water Bucket - No salt

6 1/2 Amp (panel meter)

2450 VAC Panel meter

2nd time ~~water~~

7 Amps

2300 VAC

4 1/2
sec

TN

(2)

Pinch of salt

1600 VAC

7.9 Ang

(202 Ω)

* (Make Second Head ~~Head~~ Piece !!)

* Eliminate "Compute ON"
+ "Double PBA"

Change CT Turns

Original	19	4-25-97	
Changed to	11	4-25-97	
→ Change to	13	2-17-2000	13.50

CT 13 Turns

T1 set to 2 set ??

$4 \frac{1}{7}$ sec

Panel

7.8 Amp

Panel

1850 VAC

1700 VAC ~~1850 V~~
VOM $6 \frac{1}{2}$ Amp Amps

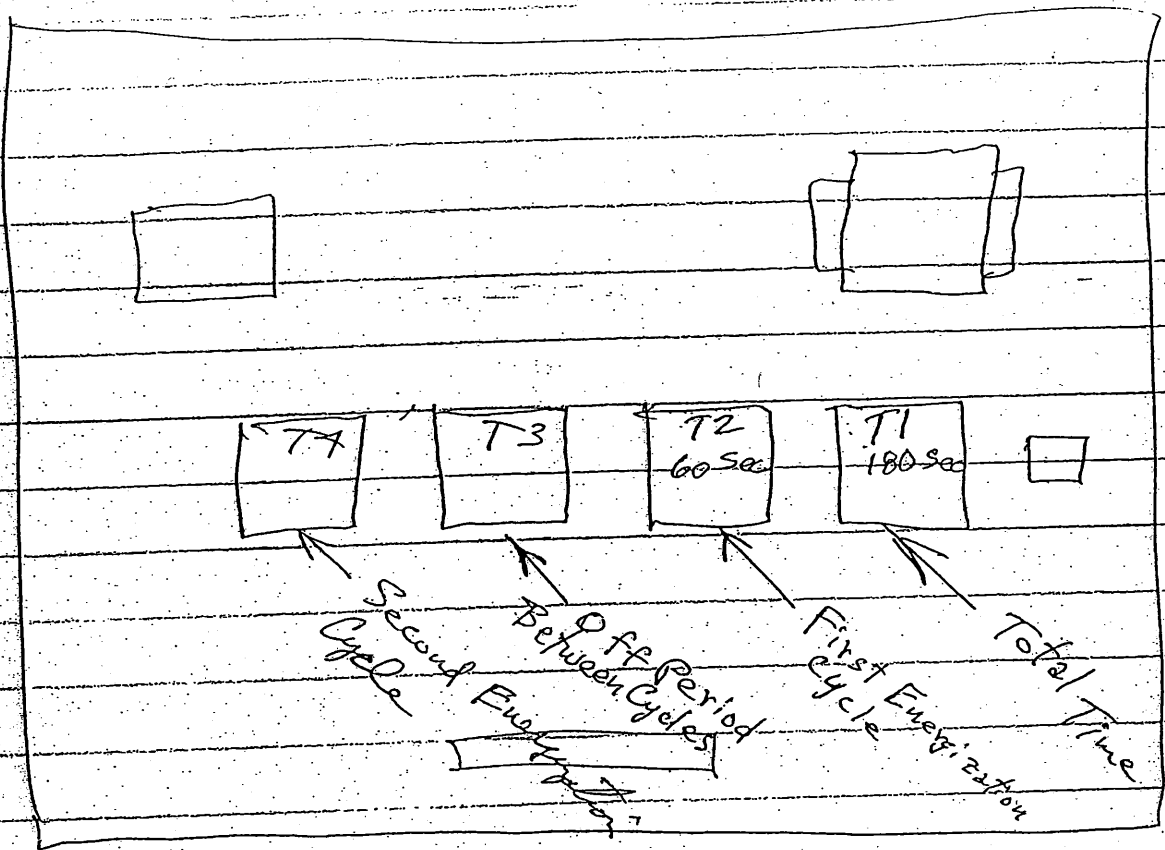
14 sec off

7.8 1850 V

$7 \frac{1}{2}$ 1700

2-17-2000
15:00

(4)



Front of Console

24 26 18 (15) } Lets use 2.0 sec ON
 12 15 } Ricky Bell 15 sec OFF
 23 15 15 } 15 sec ON

Panel Amplitude

7.8 6.3

7.8

7.6

TD⁴ OK

Log

7 Amp

1750 VAC

JAY WIECHERT MANUFACTURING

SPECIAL MACHINES - TOOLS - FIXTURES
INDUSTRIAL CONTROL SYSTEMS

719 SOUTH 10TH
FORT SMITH, ARKANSAS 72901

JUL 102 2170 P.01

JAY WIECHERT, Owner
PROFESSIONAL ENGINEER

OFFICE 501 782-5587
FAX 501 782-2178
RES. 996-2554

Feb. 23, 2000

Mr. Ricky J. Bell, Warden
Riverbend Maximum Security Institution
7475 Cockrill Bend Ind. Road
Nashville, TN 37243-0471

Dear Warden Bell:

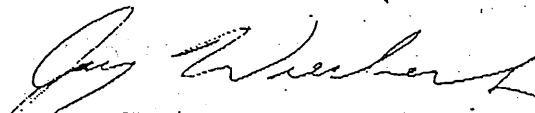
I examined the Execution Equipment at this location on Feb. 17, 2000. I used various electrical loads during this testing (including a test box of my design which simulates a typical inmate).

The regulated current was adjusted downward slightly to seven amperes. The measured voltage using my test box was 1,750 VAC. The timing of the automatic cycle was adjusted to 20 seconds ON, 15 seconds OFF, and then 15 seconds ON. This cycle will execute an inmate.

We are repairing the headpiece as requested.

Thank you.

Sincerely yours, *J*


Jay Wiechert

JAY WIECHERT MANUFACTURING

SPECIAL MACHINES - TOOLS - FIXTURES
INDUSTRIAL CONTROL SYSTEMS

719 SOUTH 10TH

FORT SMITH, ARKANSAS 72901

JAY WIECHERT, Owner
PROFESSIONAL ENGINEEROFFICE 501 782-
FAX 501 782-
RES. 986-255

March 1, 2001

Mr. Ricky J. Bell, Warden
Riverbend Maximum Security Institution
7475 Cockrill Bend Ind. Road
Nashville, TN 37243-0471

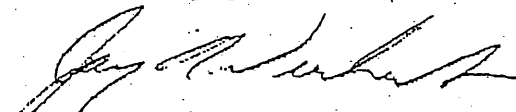
Dear Warden Bell:

I examined the Execution Equipment at this location on Feb. 28, 2000. I used various electrical loads during this testing (including a test box of my design, which simulates a typical inmate).

The voltage and current readings are similar to previous tests (1,750 VAC and 7 Amps). The timing of the automatic cycle measures 20 seconds ON, 15 seconds OFF and then 15 seconds ON. This cycle will execute an inmate.

Thank you.

Sincerely yours,


Jay Wiechert

JAY WIECHERT MANUFACTURING

SPECIAL MACHINES - TOOLS - FIXTURES
INDUSTRIAL CONTROL SYSTEMS

719 SOUTH 10TH
FORT SMITH, ARKANSAS 72901

JAY WIECHERT, Owner
PROFESSIONAL ENGINEER

OFFICE 501 782-5587
FAX 501 782-2178
RES. 904-2334

March 1, 2001

Riverbend Maximum Security Institution
7475 Cockrill Bend Ind. Road
Nashville, TN 37243-0471

Dear

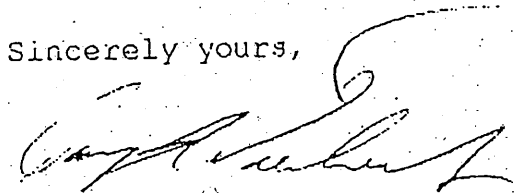
I enjoyed visiting your Institution yesterday. I sent the results of our tests to Warden Bell via FAX.

I have been working on a manual Backup System per our discussion. The transformer that I have in stock is as follows: Magnetek (previously Jefferson)
Model # 225-0166-000
KVA 15.0, 1-PH, 60HZ

The secondary winding has taps that allow us to adjust the output to 1,800 VAC with your existing primary voltage. This should work well.

I will plan on wiring this transformer with primary pigtail for your fused disconnect, and Amphenol connector for your high-voltage secondary. Transformer has NEMA 1 enclosure and will be mounted on casters. The price for this System is two thousand, and two hundred dollars (\$2,200.00). Price is FOB Ft. Smith, AR.

Sincerely yours,



Jay Wiechert

JAY WIECHERT MANUFACTURING**SPECIAL MACHINES - TOOLS - FIXTURES
INDUSTRIAL CONTROL SYSTEMS**719 SOUTH 10TH
FORT SMITH, ARKANSAS 72901JAY WIECHERT, Owner
PROFESSIONAL ENGINEEROFFICE 501 782-5587
FAX 501 782-2178
RES. 606-2554

March 29, 2001

Mr.
Riverbend Maximum Security Institution
7475 Cockrill Bend Ind. Road
Nashville, TN 37243-0471

Dear

Per your request, I have designed an automated Backup Execution System. The price for this system is eleven thousand and nine hundred dollars (\$11,900.00).

System has Eagle Signal timers to duplicate existing time cycle. Ammeter will show secondary current. The key-switch on your existing unit will be replaced to match key-switch on Backup system. Contactor will be used in primary of transformer. Allen Bradley components will be used. The transformer that I have in stock is as follows:

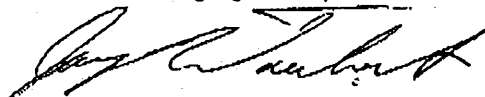
Magnetek (previously Jefferson)
Model # 225-0166-000
KVA 15.0, 1-PH, 60HZ

The secondary winding has taps that allow us to adjust the output to 1,800 VAC with your existing primary voltage. This should work well.

I will provide receptacles and plugs for ease of changing from one system to the other.

Quotation active for thirty days.

Sincerely yours,



Jay Wiechert

JAY WIECHERT MANUFACTURING

SPECIAL MACHINES - TOOLS - FIXTURES
INDUSTRIAL CONTROL SYSTEMS

719 SOUTH 10TH
FORT SMITH, ARKANSAS 72901

JAY WIECHERT, Owner
PROFESSIONAL ENGINEER

Office 479 782-5587
Res 479 996-2554

RECEIVED

JUN 14 2004

RIVERBEND MAXIMUM
SECURITY INSTITUTION
OFFICE OF WARDEN

June 10, 2004

Mr. Ricky J. Bell, Warden
Riverbend Maximum Security Institution
7475 Cockrill Bend Ind. Road
Nashville, TN 37243-0471

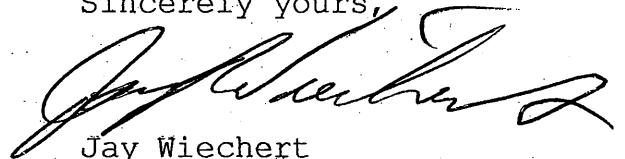
Dear Warden Bell:

I examined the Execution Equipment at this location on June 7, 2004. I used various electrical loads during this testing (including a test box of my design, which simulates a typical inmate). The ammeter was calibrated.

The voltage and current readings are similar to previous tests (1,750 VAC and 7 Amps). The timing of the automatic cycle was calibrated as follows- 20 seconds ON, 15 seconds OFF and then 15 seconds ON. This corresponds to previous settings. This cycle will execute an inmate.

I always enjoy working with you and your staff, thank you.

Sincerely yours,



Jay Wiechert

Within meeting with Mr. Jay Wiechert, of Wiechert Manufacturing on March 14 2006, the following items were discussed:

1. Source for natural sponges:
Mr. Wiechert provided me with his current source/supplier for natural sponges used in the electrocution process.

Material specification/description are 11-12" Prime Rock Island wool

2. Recommendation for future engineering/consultation:
Mr. Wiechert recommended that TDOC contact Dr. Michael Morse for future consulting needs. He also recommends that TDOC attempt to recruit the services of a local Electrical Engineer (P.E. preferred) that has "hands on" experience in high voltage repair, in the event of an equipment failure.
3. Request for preventative maintenance/RMSI site visit:
At Warden Bell's request, I asked that Mr. Wiechert make a personal site visit to perform preventative maintenance and functional testing of the RMSI capital punishment equipment. Mr. Weichert agreed and has tentatively set the schedule for mid June. Confirmation of an exact date is pending.
4. Items to review during June 2006 site visit:
 - a. functional review of RMSI electric chair procedure
 - b. electrical testing of capital punishment equipment
 - c. functional and electrical testing of the back-up transformer purchased from Wiechert Manufacturing
 - d. produce a written procedure for use of the back-up transformer

In summary, Mr. Wiechert expressed his willingness to support TDOC with consulting services during his retirement period, as long as his health would allow.

From: George Little
To: Bell, Ricky.J, Colson, Roland, Inglis, Debbie
Date: 9/15/2006 8:57:33 PM
Subject: Background Info for Scheduled Execution

Debbie, Ricky & Roland,
Please prepare following in connection with the execution: a brief summary on the modifications to the electric chair, including the involvement of JVM (?), resume' and qualifications of Mr. Weikert and logs/documentaions of training & tests with the apparatus. This information may be needed for media or other inquiries. This is needed by COB, Monday- sooner if possible. Thanks.
George L.

CC: gayleray@comcast.net, Neely, Jesse, Carter, Dorinda, Crockett, Patricia



STATE OF TENNESSEE
DEPARTMENT OF CORRECTION
RIVERBEND MAXIMUM SECURITY INSTITUTION
7475 COCKRILL BEND INDUSTRIAL ROAD
NASHVILLE, TENNESSEE 37243-0471
TELEPHONE (615) 350-3100 • FAX (615) 350-3400

September 18, 2006

George Little, Commissioner
Department of Correction
6th Floor, Rachel Jackson Building
Nashville, TN 37243

Re: Electric Chair

Dear Commissioner Little:

Pursuant to your directive, I am providing information in regards to modifications that have been made to the electric chair, involvements/communications with JVM Industries, Inc., resume of Jay Wiechert, and training/testing reports of the equipment.

On November 29, 1989, Fred A. Leuchter, Jr., completed the installation of the refurbished electric chair, control console, power supply, and test unit at the Riverbend Maximum Security Institution. Mr. Leuchter provided training to nineteen employees and each was issued a certificate as Electrocutation Technician. At the time of the installation the equipment was set to deliver 2640 volts at 6 amperage.

In 1994 Michael Morse, PhD., was involved as an expert witness in the Rickman v. Dutton lawsuit that involved the electric chair. On April 16, 1994, Dr. Morse visited Riverbend and tested electric chair equipment. His analysis was that the electrocution equipment did not deliver adequate current and did not seem to have the capacity to function with a typical load for an electrocution. This resulted in Jay Wiechert becoming involved in evaluating and making recommendations as to modifications to the system. The following changes were made:

- The brass ankle electrodes were enlarged. (flare at the front).
- Use natural sea sponges at least ½" thick (head and ankles).
- Removed the 100 amp breakers in the back room from the primary circuit.
- Installed 100 amp, 2 pole fuse disconnect switch with Bussman FRN-R100 fuses.
- Moved the power supply cabinet from the utility room to the executioner's room and positioned next to the control console so that the executioner may view ammeter.

- Mounted 100 amp fuse disconnect switch (with FRN-R80 fuses) on wall near the power supply.
- Removed and discarded 100 amp non-fused disconnect switch from the utility room wall. Ran conduit and 208 VAC wiring from the floor of utility room to the disconnect switch in the execution's room. Connected the bottom side of the switch to the power supply.
- Replaced ammeter in power supply cabinet with new meter that has 15-amp scale.

On April 25, 1994, the execution equipment was tested by Mr. Wiechert and the current was changed to 7.4 amps. The measured voltage was 1920. The original cycle was 60 seconds on, 15 seconds off, and 60 seconds on. This was changed to 45 seconds on, 15 seconds off, and 45 seconds on.

In February, 2000, an adjustment was made to the equipment to reduce the voltage to 1750. Amperage was changed to 7. The cycle was modified to 20 seconds on, 15 seconds off, and 15 seconds on.

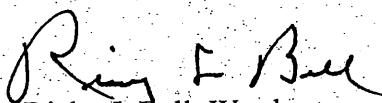
In April, 1996, a letter was received at the institution from JVM Industries, Inc., indicating that the company had acquired the design drawings and all rights to the execution technology of Fred A. Leuchter, Associates, Inc., of Boston, Massachusetts. JVM further indicated that they had assumed all guarantees on the Leuchter designed equipment throughout the country, including the system at Riverbend.

The letter went on to state that they were of the opinion that the modifications made by the Wiechert company were dangerous and inconsistent with proper execution technology and procedure and that the company would bear no legal liability if an execution was carried out with the modified equipment.

On September 23, 1996, I made a response to JVM Industries indicating that their comments appeared to be inconsistent with other experts utilized to physically examine the system. My letter went on to state that I requested specific documentation to support the company's assertion that the equipment would not function as expected and further, to refute the recommendations made by Dr. Michael Morse and Jay Wiechert. No response to my letter was ever received.

I am providing follow-up letters from Mr. Wiechert which outline his visits to the institution and testing of the equipment, as well as his resume. The letter received from JVM dated April 23, 1996, and my follow-up response of September 23, 1996, is also being included.

If you need additional information, please let me know.



Ricky J. Bell, Warden
RJB/md

JAY WIECHERT MANUFACTURING

SPECIAL MACHINES - TOOLS - FIXTURES
INDUSTRIAL CONTROL SYSTEMS

719 SOUTH 10TH
FORT SMITH, ARKANSAS 72901

Compele

JAY WIECHERT, Owner
PROFESSIONAL ENGINEER

OFFICE 501 782-5587
FAX 501 782-2178
RES. 996-2554

May 1, 1994

Mr. Michael Dutton, Warden
Riverbend Maximum Security Institution
7475 Cockrill Bend Ind. Rd.
Nashville, TN 37209

Dear Warden Dutton:

I have examined the Execution Equipment at this location and find that it is operating correctly.

Various electrical loads (100 ohms to 260 ohms) have been connected to the high voltage leads at the chair location. These loads simulate a broad range of inmate physique. The measured voltage and current during testing will properly execute an inmate.

Sincerely yours,

Jay Wiechert

Jay Wiechert

PE #3731

JAY WIECHERT MANUFACTURING

SPECIAL MACHINES - TOOLS - FIXTURES
INDUSTRIAL CONTROL SYSTEMS

719 SOUTH 10TH
FORT SMITH, ARKANSAS 72901

JAY WIECHERT, Owner
PROFESSIONAL ENGINEER

OFFICE 501 782-5587
FAX 501 782-2178
RES. 996-2554

January 26, 1996

Mr. Bobby Campbell
Associate Warden for Administration
Riverbend Maximum Security Institution
Nashville, TN 37243-0471

Dear Mr. Bobby Campbell:

The following modifications have been made to the Electrocutation System built for the State of Tennessee by Fred A. Leuchter Associates, Inc. These modifications were made by Jay Wiechert and by the technical personnel at Riverbend Maximum Security Institution. Work performed by Riverbend employees was examined and approved by Jay Wiechert.

- A. Components of Electrocutation System were consolidated in Executioners Room. Modular Power Supply with meters was moved from utility room. Fused Disconnect Switch was mounted on wall near power supply in Executioners Room.
- B. Circuit Breaker (CB3) in Modular Power Supply Cabinet was eliminated because normal execution current exceeds device rating and would cause unwanted shut-down of system. Circuit is now protected by fuses (incoming power).
- C. The Current Regulation Circuitry was modified to permit more amperes to flow during an execution. Original design limited the current flow to four and one-half amps. Circuit was modified to allow eight amps of current which is consistent with electrocution history. This was accomplished by modifying the existing monitoring circuitry. Originally the current transformer in the monitoring circuit had nineteen turns of high voltage cable. This was changed to eleven turns.

JAY WIECHERT MANUFACTURING

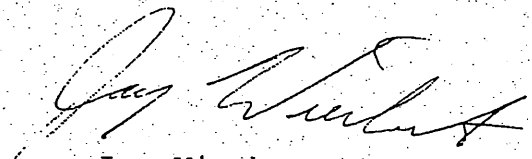
SPECIAL MACHINES - TOOLS - FIXTURES
INDUSTRIAL CONTROL SYSTEMS

719 SOUTH 10TH
FORT SMITH, ARKANSAS 72901

OFFICE 501 782-5587
FAX 501 782-2178
RES. 996-2554

WIECHERT, Owner
PROFESSIONAL ENGINEER

- D. Ammeter in Power Supply Cabinet was changed to reflect new amperage capability. Full scale is now fifteen amps. Shielding of back-side of meter was added to increase accuracy. Meter is now within view of executioner (see A. above).
- E. The wiring within the Control Console was modified to eliminate the "Test" feature. This was done to prevent energizing the system inadvertently when moving the key switch from the "operate" position to the "off" position.
- F. The automatic timing cycle was adjusted as follows: Originally, the system was energized for two periods of one minute each with a pause of ten or fifteen seconds between. This was changed to 45 seconds ON, 15 seconds OFF, and then 45 seconds ON. The electrical energy provided by this cycle is consistent with other modern execution equipment.



Jay Wiechert
PE #3731

JAY WIECHERT MANUFACTURING

**SPECIAL MACHINES - TOOLS - FIXTURES
INDUSTRIAL CONTROL SYSTEMS**

719 SOUTH 10TH
FORT SMITH, ARKANSAS 72901

JAY WIECHERT, Owner
PROFESSIONAL ENGINEER

OFFICE 501 782-5587
FAX 501 782-2178
RES. 936-2554

Feb. 23, 2000

Mr. Ricky J. Bell, Warden,
Riverbend Maximum Security Institution
7475 Cockrill Bend Ind. Road
Nashville, TN 37243-0471

Dear Warden Bell:

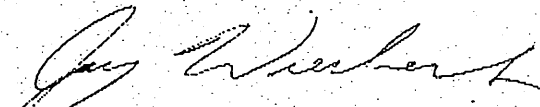
I examined the Execution Equipment at this location on Feb. 17, 2000. I used various electrical loads during this testing (including a test box of my design which simulates a typical inmate).

The regulated current was adjusted downward slightly to seven amperes. The measured voltage using my test box was 1,750 VAC. The timing of the automatic cycle was adjusted to 20 seconds ON, 15 seconds OFF, and then 15 seconds ON. This cycle will execute an inmate.

We are repairing the headpiece as requested.

Thank you.

Sincerely yours, *J*


Jay Wiechert

JAY WIECHERT MANUFACTURING

SPECIAL MACHINES - TOOLS - FIXTURES
INDUSTRIAL CONTROL SYSTEMS

719 SOUTH 10TH
FORT SMITH, ARKANSAS 72901

JAY WIECHERT, Owner
PROFESSIONAL ENGINEER

OFFICE 501 782-5587
FAX 501 782-2178
RES. 996-2554

March 1, 2001

Mr. Ricky J. Bell, Warden
Riverbend Maximum Security Institution
7475 Cockrill Bend Ind. Road
Nashville, TN 37243-0471

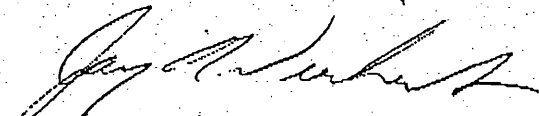
Dear Warden Bell:

I examined the Execution Equipment at this location on Feb. 28, 2000. I used various electrical loads during this testing (including a test box of my design, which simulates a typical inmate).

The voltage and current readings are similar to previous tests (1,750 VAC and 7 Amps). The timing of the automatic cycle measures 20 seconds ON, 15 seconds OFF and then 15 seconds ON. This cycle will execute an inmate.

Thank you.

Sincerely yours,



Jay Wiechert

JAY WIECHERT MANUFACTURING

SPECIAL MACHINES - TOOLS - FIXTURES
INDUSTRIAL CONTROL SYSTEMS

719 SOUTH 10TH
FORT SMITH, ARKANSAS 72901

Office 479 782-5587
Res 479 996-2554

RECEIVED

JUN 14 2004

RIVERBEND MAXIMUM
SECURITY INSTITUTION
OFFICE OF WARDEN

June 10, 2004

Mr. Ricky J. Bell, Warden
Riverbend Maximum Security Institution
7475 Cockrill Bend Ind. Road
Nashville, TN 37243-0471

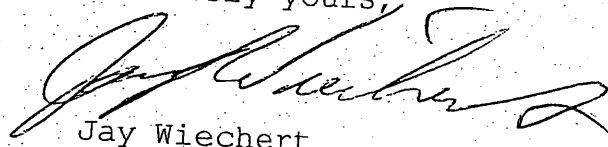
Dear Warden Bell:

I examined the Execution Equipment at this location on June 7, 2004. I used various electrical loads during this testing (including a test box of my design, which simulates a typical inmate). The ammeter was calibrated.

The voltage and current readings are similar to previous tests (1,750 VAC and 7 Amps). The timing of the automatic cycle was calibrated as follows- 20 seconds ON, 15 seconds OFF and then 15 seconds ON. This corresponds to previous settings. This cycle will execute an inmate.

I always enjoy working with you and your staff, thank you.

Sincerely yours,



Jay Wiechert



CUSTOM
MACHINERY
GROUP

Wellsboro Industrial Park
PO Box 636
Wellsboro, PA 16901
717-724-7553 FAX-7989

ENGINEERS AND BUILDERS OF CUSTOM MACHINERY

April 23, 1996

Mr. Bobby Campbell
Associate Warden for Administration
Riverbend Maximum Security Institution
Nashville, TN 37243-0471

Dear Warden Campbell,

Please be advised that JVM Industries, Inc. has acquired the design drawings and all rights to the Execution Technology of Fred A. Leuchter, Associates, Inc. of Boston, Massachusetts.

JVM Industries assumes all guarantees on Leuchter designed and installed equipment throughout the country including your Modular Electrocution System at Riverbend.

However, it has come to our attention that certain improper and unsound modifications have been made to Leuchter's original equipment by the Wiechert Company of Fort Smith Arkansas per the enclosed letter.

We are of the opinion these modifications, particularly (c) and (f) are dangerous and inconsistent with proper Execution Technology and Procedure. These modifications may result in 'tissue cooking' of the executee and further, fibrillation of the executees heart resulting in failure to execute and a brain dead vegetable at the conclusion of the execution procedure.

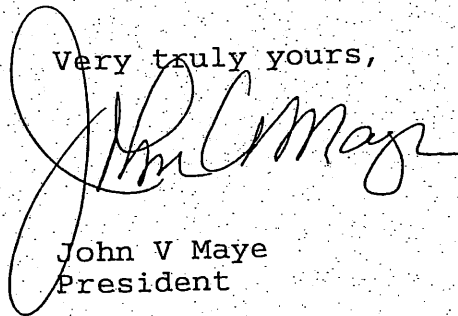
Please be advised the Wiechert modifications void the Leuchter guarantee JVM has assumed. In addition it places the State of Tennessee at risk in terms of failing to properly execute. in the event of the use of said system.

We bear no legal liability in this matter except to advise you of these conditions and the possibility of torture of the inmate if an execution is carried out with the modified equipment.

Please advise if the Wiechert modifications were in fact carried out on the Leuchter equipment at Riverbend and, if they in fact were, whether you intend to make the necessary changes to restore the equipment to proper operating order, thus reinstating your guarantee and preventing your system from becoming an instrument of torture.

I await your reply on this matter.

Very truly yours,



John V Maye
President

cc: Commissioner of Correction
Warden, Riverbend Maximum Security Institution

enc.



CUSTOM
MACHINERY
GROUP

ENGINEERS AND BUILDERS OF CUSTOM MACHINERY



Department of Correction
Division of Adult Institutions

Riverbend Maximum Security Institution

7475 Cockrill Bend Industrial Road

Nashville, Tennessee 37243-0471

September 23, 1996

John V. Maye, President
JVM Industries, Inc.
Wellsboro Industrial Park
P. O. Box 636
Wellsboro, PA 16901

Dear Mr. Maye:

My office is in receipt of your letter to Bobby Campbell dated April 23, 1996. In your letter you make several assertions of possible problems concerning the use of the electrocution system at Riverbend. Your comments appear to be inconsistent with the recommendations provided by the experts utilized to physically examine the system.

JVM is requested to provide specific documentation to support its assertions that the system will not function as expected, and further, to refute the modifications recommended by Dr. Michael S. Morse and performed by Joy Wiechert.

Sincerely,

Ricky J. Bell
Ricky J. Bell, Warden

RJB/md

JAY WIECHERT MANUFACTURING

SPECIAL MACHINES - TOOLS - FIXTURES
INDUSTRIAL CONTROL SYSTEMS

719 SOUTH 10TH
FORT SMITH, ARKANSAS 72901

JAY WIECHERT, Owner
PROFESSIONAL ENGINEER

Office 479 782-5587

Res. 479 996-2554

RESUME

Jay Wiechert
719 So. 10th
Ft. Smith, AR 72901

September 18, 2006

Birthdate: 6-28-43
Marital: Married and two daughters
Education: BSEE 1965 and MSEE 1967 Kansas State University
Licenses: Professional Engineer, AR #3731
Private Pilot, Commercial Drivers License.
Membership: Mensa, AOPA, EAA.

EMPLOYMENT

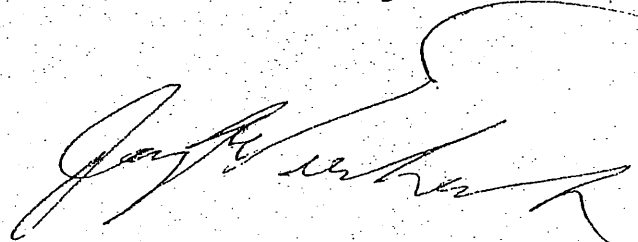
DATE

COMPANY

TITLE

COMMENTS

7/73 to Date	Jay Wiechert Manufacturing	Self-Employed	Design and fabricate Automatic Machinery for Manufacturers.
9/72 to 8/73	General Electric Louisville, KY	Design Eng. Home Laundry Engineering	Cost improvement projects, Automatic Washer and Dryer.
7/70 to 8/72	Whirlpool Corp. Ft. Smith, AR Gas Air Cond. Eng.	Development Engineer G.A.C. Eng.	Reliability improvement of Gas Air Conditioner. Responsible for electric motors and controls.
2/70 to 7/70	Whirlpool Corp. St. Joseph, Mich. Laundry Eng.	Project Eng. Compactor Eng.	Cost improvement of Trash Compactor. Design Motor, Transmission, Controls.
8/67 to 2/70	Whirlpool Corp. St. Joseph, Mich. Laundry Eng.	Engineer Dryer Div. Eng.	Development of new features and cost improvement projects on clothes dryer. Electrical controls and electronic dryness sensor design. Three Patents.
8/66 to 7/67	U.S. Government Ft. Riley, Kansas	Instructor	Electronic and math courses for Army, Part time employment while attending K.S.U.
6/64 to 7/66	Steel & Pipe Supply Manhattan, Kansas	Welder and Electrician	Steel Building Fabrication and Erection. Part time employment While attending K.S.U.



JAY WIECHERT MANUFACTURING

SPECIAL MACHINES - TOOLS - FIXTURES
INDUSTRIAL CONTROL SYSTEMS
719 SOUTH 10TH
FORT SMITH, ARKANSAS 72901

JAY WIECHERT, Owner
PROFESSIONAL ENGINEER

Office 479 782-5587
Res 479 996-2554

September 19, 2006

Mr. Ricky J. Bell, Warden
Riverbend Maximum Security Institution
7475 Cockrill Bend Ind. Road
Nashville, TN 37243-0471

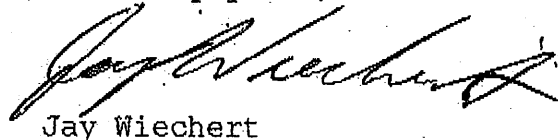
Dear Warden Bell:

I examined the Execution Equipment at this location on September 18, 2006. I used various electrical loads during this testing (including a test box of my design, which simulates a typical inmate). I installed an ammeter, mounted on a pedestal, for easy viewing by executioner. This ammeter monitors primary current at the main disconnect. Therefore, current is displayed when using the original equipment or when using the "Back-up" equipment.

The voltage and current readings are similar to previous tests (1,750 VAC and 7 Amps). The "Back-Up" equipment provides results similar to original equipment. This cycle will execute an inmate.

I always enjoy working with you and your staff, thank you.

Sincerely yours,



Jay Wiechert

JAY WIECHERT MANUFACTURING

719 SOUTH 10TH

FORT SMITH, ARKANSAS 72901

PHONE 479-782-5587

S
O
L
D
T
O

DATE September 22, 2006

Riverbend Maximum Security Insti.

7475 Cockrill Bend Ind. Road

CUSTOMER P.O.# Verbal

Nashville, TN 37243-0471

DATE SHIPPED September 18, 2006 TERMS Net 30

QUANTITY	DESCRIPTION	PRICE
1	Examine Electrical Equipment and Install	
	Ammeter with Current Transformer	\$2,935.00
	Requested by Mr. _____ and	
	Mr. Ricky Bell, Warden	

INVOICE

JAY WIECHERT MANUFACTURING

719 SOUTH 10TH

FORT SMITH, ARKANSAS 72901

PHONE 479-782-5587

This Document Has Been Received
As The Original Invoice.

INV # 041907

DATE April 19, 2007

Riverbend Maximum Security Insti.

7475 Cockrill Bend Blvd.

Nashville, TN 37243-0471

CUSTOMER P.O.# Verbal

RECEIVED

JUN 26 2007

Business Office

FMSI

DATE SHIPPED April 2, 2007

TERMS Net 30

QUANTITY	DESCRIPTION	PRICE
1	Examine Electrical Equipment and Assist with Procedure Changes	\$2,900.00
	Requested by Mr. _____ and Mr. Ricky Bell, Warden	

479-6287
07-01-2007

V710454095 02

BATCH DATE	BATCH #	
06-26-2007	002	
TC	CC	OBJ CODE
126	10	089
VOUCHER #	DOC REF #	
11657	DP 0703B 10	
DUE DATE	AMOUNT	
05-19-2007	2,900.00	

INVOICE

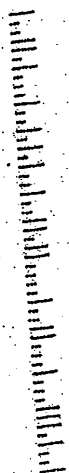
RECEIVED

JUN 26 2007

Business Office
RMSI

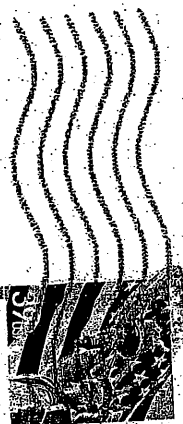
Warden, Mr. Ricky Bell

3724330471



Riverbend Maximum Security Insti.
7475 Cockrill Bend Blvd.
Nashville, TN 37243-0471

Jay Wiechert Mfg.
719 South 10th
Ft. Smith, AR 72901



FORT SMITH AR 729
20 APR 2007 PM 1 T

PHIL BREDESEN
GOVERNOR



GEORGE M. LITTLE
COMMISSIONER

STATE OF TENNESSEE
DEPARTMENT OF CORRECTION
SIXTH FLOOR, RACHEL JACKSON BUILDING
320 SIXTH AVENUE NORTH
NASHVILLE, TENNESSEE 37243-0465
Office (615) 741-1000 • FAX (615) 532-8281

April 30, 2007

The Honorable Phil Bredesen
Governor of Tennessee
First Floor, State Capitol
Nashville, TN 37243

Dear Governor Bredesen:

The Department of Correction has completed a comprehensive review of the manner in which death sentences are administered in Tennessee. A copy of our report is attached.

After a rigorous consideration of our options and consultation with the review committee, I have directed the continued use of a three-chemical lethal injection protocol. The decision was based on this type of protocol being a proven method of execution. Tennessee and twenty-nine other jurisdictions have used this general method. It has been found to be humane when properly administered. We have significantly improved the documentation and procedures to support the three-chemical protocol.

We have also reviewed our electrocution protocol. We found the existing procedures to be adequate. However, we have revised the procedures to make them more clear, concise, and complete.

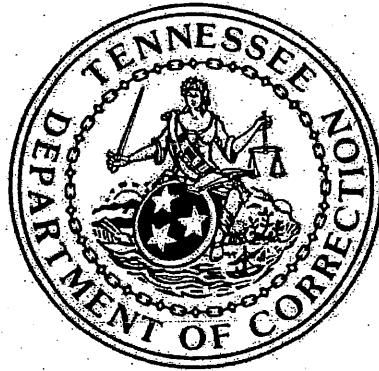
We will continue with on-going reviews of our protocols and procedures. We will continue to assess best practices, and we will make appropriate revisions and/or recommend improvements, as appropriate. As of this date, we have begun training using the updated procedures. The Department is ready to carry out the laws of the State of Tennessee.

Sincerely,


George M. Little

GML:PC
Attachment

**TENNESSEE
DEPARTMENT OF CORRECTION**



**Report on Administration of Death
Sentences in Tennessee**

April 2007

**Prepared by
Tennessee Department of Correction**

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Appendix 10

 A. Executive Order No. 43

 B. Florida Governor’s Commission on Administration of Lethal Injection

 C. Transcript of April 5, 2007 Public Hearing

Executive Summary

In response to Executive Order No. 43, Commissioner George M. Little appointed a committee to review the administration of death sentences in Tennessee and revise the Department's Execution Protocols and Manual. The Committee utilized a number of resources including, but not limited to, the following:

- The Office of the Attorney General and Reporter
- Participants in past Tennessee executions, including Riverbend Maximum Security Institution Warden Ricky Bell, members of the IV team, and a physician
- Corrections professionals and legal experts from other jurisdictions
- Anesthesiologists
- An Electrical Engineer
- The Final Report of Florida's Governor's Commission on Administration of Lethal Injection
- Court opinions in execution protocol cases from Tennessee and other jurisdictions.

The Department also held a public hearing on April 5, 2007 for the purpose of receiving input from persons with relevant expertise on the issue of how to best ensure that the Department's execution protocol provides constitutional and appropriate executions. Two attorneys made presentations at the hearing, and comments were also taken from other attendees.

Based upon its research and the input it received from various sources, the Department developed updated execution manuals for lethal injection and electrocution that incorporate best practices from the Department's own experience and that of other jurisdictions. Highlights include:

- Detailed descriptions of each step of the electrocution and lethal injection processes
- Detailed descriptions of the qualifications, selection processes, and training requirements for execution team members
- A detailed description of the services provided to family members of the condemned inmate's victims
- Enhanced requirements for contemporaneous documentation of each significant stage of an execution as it is carried out
- Enhanced accountability in connection with the procurement, storage, and disposition of the lethal injection chemicals.

The protocol for lethal injections employs the following chemicals in the sequence shown:

- 5 Grams of Sodium Thiopental in 200 cc of sterile water
- 100 Mg of Pancuronium Bromide (1 Mg/ml)
- 100 mL of 2 mEq/mL Potassium Chloride, for a total of 200 mEq.

After the infusion of each chemical, the IV line is flushed with 50 cc saline solution.

At least 29 other jurisdictions, including the Federal Bureau of Prisons, have lethal injection protocols consisting of sodium thiopental, pancuronium bromide, and potassium chloride in varying amounts. Sodium thiopental is a barbiturate that rapidly induces general anesthesia. Pancuronium bromide is a neuromuscular blocking agent that induces paralysis and causes breathing to cease. Potassium chloride is a salt that interferes with the electrical signaling essential to normal heart function. In the amounts listed above, each of the chemicals, independently, is lethal.

Tennessee has chosen to use 5 grams of sodium thiopental, the largest amount used by other jurisdictions, to provide enhanced assurance that the condemned inmate will be unconscious when the remaining chemicals are infused.

The revised lethal injection and electrocution manuals and protocols will provide further assurance that death sentences are administered in a constitutional and appropriate manner in Tennessee.

Introduction

On February 1, 2007, Governor Phil Bredesen issued Executive Order No. 43 directing the Department of Correction to complete a comprehensive review of the manner in which the death penalty is administered in Tennessee. The Executive Order provided as follows:

1. I hereby direct the Commissioner of Correction ("Commissioner") to initiate immediately a comprehensive review of the manner in which death sentences are administered in Tennessee. This review shall specifically include the state's protocols and any related procedures, whether written or otherwise, related to the administration of death sentences, both by lethal injection and by electrocution. In completing this review, the Commissioner is directed to utilize all relevant and appropriate resources, including but not limited to scientific and medical experts, legal experts, and Correction professionals both from within and outside of Tennessee. As a component of this review, the Commissioner is further directed to research and perform an analysis of best practices used by other states in administering the death penalty.
2. As soon as practical, but no later than May 2, 2007, the Commissioner of Correction is directed to establish and provide to me the new protocols and related written procedures for administering death sentences in Tennessee, both by lethal injection and electrocution. In addition, the Commissioner is directed to provide me with a report outlining the results of the review completed pursuant to paragraph one (1) above.

In response to Executive Order No. 43, Commissioner Little appointed a Committee to undertake the required review and prepare recommended protocols for the administration of the death penalty in Tennessee. After extensive research and after receiving input from experts in relevant fields, the Committee developed new execution manuals incorporating written procedures based on Tennessee's own experience and that of other jurisdictions, as well as input from medical experts.

This report describes the Department's methodology in developing the new manuals and the input it received from various sources, and summarizes the most significant issues addressed in the manuals.

Methodology

In response to Executive Order No. 43, Commissioner George M. Little appointed a Committee to undertake the required review of the manual of procedures for electrocution and lethal injection in Tennessee. The Committee consisted of Deputy Commissioner Gayle Ray, Assistant Commissioner of Operations Roland Colson, Riverbend Maximum Security Institution Warden Ricky Bell, Executive Assistant to the Commissioner Julian Davis, and General Counsel Debra K. Inglis.

Initially, the Department received guidance from the State Attorney General's Office concerning the legal challenges to execution protocols in Tennessee and other jurisdictions and possible areas of inquiry for the Committee. The Committee reviewed the opinion issued by the Tennessee Supreme Court in *Abdur'Rahman v. Bredesen*, 181 S.W.3d 292 (Tenn. 2005), *cert. denied*, 126 S.Ct. 2288 (2006), as well as the opinions filed by the Chancery Court for Davidson County and the Tennessee Court of Appeals in the same proceeding. It reviewed the complaint filed in *Harbison v. Little*, No. 3:06-1206 (M.D. Tenn.) concerning Tennessee's previous protocol. It also reviewed court opinions and other documents filed in cases challenging execution protocols from other jurisdictions.

The Department identified several areas warranting particular focus in the review process. As to lethal injection, these areas included the selection and amounts of the chemicals to be used, requirements pertaining to the procurement and storage of the lethal injection chemicals, the qualifications and training required of the members of the IV team and the executioner, the method to be used for obtaining venous access when the IV team cannot establish peripheral venous access, and documentation requirements pertaining to the administration of the lethal chemicals. As to electrocution, the committee considered whether any modifications should be made to the settings on the electric chair control panel, as well as the requirements for regular testing and maintenance of the equipment.

The Committee reviewed the Department's previous protocol and execution manual. Ricky Bell, Warden of the Riverbend Maximum Security Institution, answered questions from other Committee members about the process used in the state's two recent lethal injection executions as well as questions about the electrocution process. The Committee also met with other participants in Tennessee's two lethal injection executions about specific areas.

The Committee consulted a number of other jurisdictions for information on their protocols, the development of their protocols, and their experiences in implementing those protocols. While some jurisdictions were unwilling to share information due to legal requirements for maintaining confidentiality, the Committee was able to obtain information from several jurisdictions. Particularly

helpful was information obtained by the Committee during two on-site meetings with Virginia Department of Corrections staff in Greensville, Virginia and with Federal Bureau of Prisons staff at U.S.P. Terre Haute.

At the Greensville Correctional Facility, the Deputy Warden, other institutional staff, and representatives of the Virginia Attorney General's Office answered questions about all aspects of Virginia's lethal injection process and provided a tour of the capital punishment area.

At U.S.P. Terre Haute, the Federal Bureau of Prisons' execution team gave a comprehensive presentation to the Committee and representatives of several other jurisdictions. The presentation included a discussion of lessons learned when carrying out lethal injection executions in several high profile cases. The federal execution team demonstrated its procedure while conducting training exercises.

The Committee consulted with two anesthesiologists concerning lethal injection and an electrical engineer concerning electrocution. The Committee also consulted with the physician who is present at Tennessee's executions to pronounce death and to perform a cut-down procedure, if necessary.

The Committee reviewed the Final Report with Findings and Recommendations issued by Florida's Governor's Commission on Administration of Lethal Injection on March 1, 2007.

The Department also held a public hearing on April 5, 2007. Representatives of the Tennessee Medical Association, Tennessee Bar Association, University of Tennessee College of Medicine, Southeastern Pharmacology Society, the Federal Public Defender for the Middle District of Tennessee, the Federal Defender Services of Eastern Tennessee, Inc., and specific members of the defense bar were invited to provide input on how to best ensure that the Department's execution protocol provides constitutional and appropriate executions. Two attorneys made presentations at the hearing, and comments were also taken from other attendees. A transcript of the hearing is attached.

The Committee met on the following dates:

February 6, 2007
February 15, 2007
February 20, 2007
February 22, 2007

March 5, 2007
March 8, 2007
March 14, 2007
March 16, 2007
March 19, 2007
March 23, 2007
March 28, 2007
March 30, 2007

April 2, 2007
April 5, 2007
April 10, 2007
April 12, 2007
April 16-17, 2007
April 19, 2007
April 25, 2007

Selected Areas of Inquiry – Lethal Injection

The following issues relating to lethal injection were among those given particular attention in researching best practices:

A. Lethal Injection Chemical Selection

The most significant issue the Department addressed was the selection of the chemicals and dosage to be used in lethal injection executions in Tennessee. After considerable research and consultation with medical experts, the Department has retained a three-chemical protocol.

The following is a summary of the three best alternatives considered by the Department, and its findings regarding the advantages and disadvantages of each.

1. Three Chemical Protocol (5 Grams of Sodium Thiopental, 100 Mg of Pancuronium Bromide, and 200 mEq. of Potassium Chloride)

At least 30 jurisdictions, including the Federal Bureau of Prisons and Tennessee under its previous protocol, have a three-chemical lethal injection protocol consisting of sodium thiopental, pancuronium bromide, and potassium chloride in varying amounts. Sodium thiopental is a barbiturate that rapidly induces general anesthesia. Five grams of sodium thiopental given intravenously is, by itself, lethal. Pancuronium bromide is a neuromuscular blocking agent that induces paralysis and causes breathing to cease. An intravenous injection of 100 Mg of Pancuronium Bromide is also lethal. Potassium chloride is a salt that interferes with the electrical signaling essential to normal heart function. A 200 mEq dose administered intravenously causes cardiac arrest and rapid death.

The issues raised on behalf of death row inmates have generally focused on the potential for error in the administration of the three-chemical protocol. It is generally agreed that if administered correctly and without error the protocol would result in a relatively painless death. In an 8th Amendment challenge to the three-chemical protocol brought by a Tennessee inmate under sentence of death, the Tennessee Court of Appeals summarized the inmate's position as follows:

The evidence is essentially uncontradicted that the injection of either Pavulon [pancuronium bromide] or potassium chloride, by themselves, in the dosages required by Tennessee's three-drug protocol would cause excruciating pain. Without sedation, the injection of potassium chloride would, in the words of the anesthesiologist testifying on Mr. Abdur'Rahman's behalf, "deliver the maximum amount of pain the veins

can deliver.” Similarly, persons receiving a massive dose of Pavulon without sedation would be conscious while they asphyxiated. Thus, the ultimate determination regarding whether Tennessee’s three-drug protocol causes unnecessary physical pain or psychological suffering depends on the efficacy of the injection of Sodium Pentothal [sodium thiopental] that precedes the injections of Pavulon and potassium chloride.

Abdur’Rahman v. Bredesen, 2004 WL 2246227, *16 (Tenn. App. 2004), *aff’d*, *Abdur’Rahman v. Bredesen*, 181 S.W.3d 292 (Tenn. 2005). After reviewing the expert testimony presented in that case as well as the conclusions reached by courts in other jurisdictions, the Court concluded:

In light of the evidence that the Sodium Pentothal is administered before the Pavulon and the potassium chloride, and that it remains effective until death occurs, we agree with the trial court’s conclusion that Mr. Abdur’Rahman failed to prove that the injection of chemicals in accordance with Tennessee’s three-drug protocol would cause unnecessary physical pain or psychological suffering.

Id. at 16.

Consistent with the findings of the Court in *Abdur’Rahman*, the experts consulted by the Committee all agreed that the intravenous administration of 5 grams of sodium thiopental in a person would be lethal, that it would render the person unconscious within a few seconds, and that its anesthetic effect would continue until death. Accordingly, the Department found that the three chemical protocol, when administered appropriately, will result in a humane death.

Several factors weigh in favor of retaining the three-chemical protocol. Tennessee’s experience in implementing the protocol has been positive. Tennessee’s protocol has been upheld by all courts that have ruled upon its constitutionality. In addition, the three-chemical protocol has been used in almost all of the lethal injection executions that have taken place in this country, allowing Tennessee to draw upon the considerable experience of other jurisdictions in implementing the protocol.

Pancuronium bromide is included in the protocol because it speeds the death process, prevents involuntary muscular movement that may interfere with the proper functioning of the IV equipment, and contributes to the dignity of the death process.

The Department also took into consideration several factors that weighed against retaining the three-chemical protocol. The procedure is the most complicated of the three protocols, and there is a remote chance of an error in implementation that may cause the inmate to incur brief pain. Finally, the three-chemical

protocol presents the greatest difficulty in accounting for the lethal injection chemicals, particularly because pancuronium bromide requires refrigeration.

2. Two-Chemical Protocol (Sodium Thiopental and Potassium Chloride)

The Department considered a two-chemical protocol consisting of sodium thiopental and potassium chloride. This protocol has an advantage over the three-chemical protocol in that it eliminates the use of pancuronium bromide. As a result, it would address the allegation that, although appearing unconscious, a condemned inmate might in fact be conscious and experience pain from the administration of potassium chloride. It would also likely result in a somewhat faster death than a one-chemical protocol. On the other hand, the administration of potassium chloride without a preceding dose of pancuronium bromide would typically result in involuntary movement which might be misinterpreted as a seizure or an indication of consciousness. This two-chemical protocol has also not been used by any other jurisdiction to carry out an execution.

3. One-Chemical Protocol (Sodium Thiopental)

Finally, the Department considered the merits of a one-chemical protocol consisting of 5 grams of sodium thiopental.

The primary advantage of the one-chemical protocol is that it is much simpler to administer and provides an even lower risk of error in its administration. As compared to the two- and three- chemical protocols, it has the advantage of eliminating both of the chemicals which, if injected into a conscious person, would cause pain. It is similar to the process used in animal euthanasia. Using one chemical that does not require refrigeration greatly simplifies the process of maintaining and accounting for the lethal injection chemicals.

The one-chemical protocol has several disadvantages. First, the two- and three-chemical protocols would likely result in a more rapid death. Second, the effect and required dosage of sodium thiopental would be less predictable and more variable when it is used as the sole mechanism for producing death than it would when used in combination with pancuronium bromide and potassium chloride. Third, to date no other state has used a similar protocol, and thus in the context of lethal injection executions there is no experience upon which Tennessee can draw.

B. Lethal Injection Chemical Procurement and Storage

The Department's previous protocol provided assurance that the lethal injection chemicals would be procured and stored in such a way as to further minimize the

possibility of contamination, dilution, or adulteration or loss of the chemicals. An examination of best practices from other jurisdictions, however, suggests that accountability would be enhanced through improved documentation of these processes. Accordingly, the protocol includes enhanced documentation requirements with regard to the procurement and storage of lethal injection chemicals.

C. IV Team Qualifications and Training

A review of best practices from other jurisdictions reveals that persons responsible for establishing IV access should have quality training in IV therapy, and preferably possess certification or licensure in a health-related field that includes establishing IV access within its scope of practice. Although Tennessee has always used Emergency Medical Technicians with IV certification or certified paramedics to establish IV access, the previous Execution Manual did not include such a requirement. The updated manual expressly requires that persons responsible for establishing IV access have such training and certification.

Best practices in other jurisdictions require that, in addition to the continuing education required to maintain their certification and licensure, IV team members should also regularly practice establishing IV access during execution training exercises. This practice has always been in place in Tennessee, but not in writing. The updated manual expressly requires it.

D. Use of Cut-Down Procedure

The Department also considered the use of a cut-down procedure and various alternative procedures with several experts. The Department determined that cut-down procedures are not particularly difficult for physicians to perform, especially for those who have prior experience performing the procedure. Accordingly, it has been retained as an option if needed to gain IV access.

E. Executioner Qualifications and Training

Although not all jurisdictions require the executioner to have training in IV therapy, such training prepares the executioner to recognize when IV access is not adequately established, allowing him to take appropriate corrective action. The long-standing but unwritten practice in Tennessee has always been to use an executioner trained in IV therapy. The Department considers this to be an important requirement and has expressly incorporated it into the protocol.

F. Chemical Administration Documentation

An examination of best practices from other jurisdictions suggested that post-execution review of lethal injection executions is facilitated by contemporaneous documentation of the administration of the lethal injection chemicals. An express requirement for contemporaneous documentation by a member of the IV team has been incorporated into the updated manual.

Selected Areas of Inquiry – Electrocutation

The following issues relating to electrocutation were among those given particular attention in researching best practices:

A. History of Tennessee's Electric Chair

In 1989, Tennessee's electric chair was refurbished and a new electrocution system was installed by Fred A. Leuchter Associates, Inc. Later the system underwent substantial modifications at the recommendation of Dr. Michael Morse, PhD, and Jay Wiechert, a professional electrical engineer who has consulted with a number of states on electrocution protocols. Through subsequent years Mr. Weichert has consulted with the Tennessee Department of Correction concerning the operation of its electrocution system and has tested and maintained the system in working order.

The Committee met with Mr. Weichert at Riverbend Maximum Security Institution on March 5, 2007. He explained in detail how the system operates, the recommended settings, and how to respond to various contingencies. His recommendations have been incorporated into the electrocution manual.

B. Electrocutation Equipment Control Settings

Expert input received by the Department indicates that the electrocution equipment should be set to render 1750 volts at 7 amps, cycled on for 20 seconds, off for 20 seconds, and on for an additional 15 seconds. These settings have been retained.

C. Electrocutation Equipment Maintenance and Testing

Although not required by the state's previous written protocol, the Department has tested its electrocution system at least quarterly and has conducted regular maintenance as required. The Department considers this schedule to be adequate and has expressly incorporated it into the updated manual. The updated manual also expressly requires documentation of testing, maintenance, and modifications in a permanent ledger.

Selected References

Hamilton v. Jones, 472 F.3d 814 (10th Cir. 2007)

Taylor v. Crawford, 457 F.3d 902 (8th Cir. 2006)

Brown v. Beck, 445 F.3d 752 (4th Cir. 2006), *pet. for cert filed*, (April 20, 2006) (No. 05-10482)

Morales v. Hickman, 438 F.3d 926 (9th Cir. 2006), *cert. denied*, 126 S.Ct. 1314, 163 L.Ed.2d 1148 (2006)

Morales v. Tilton, 465 F.Supp.2d 972 (N.D.Cal. 2006)

Evans v. Saar, 412 F.Supp.2d 519 (D. Md. 2006)

Reid v. Johnson, 333 F.Supp.2d 543 (E.D.Va. 2004)

Blaze v. Rees, ____ S.W.3d ____, 2006 WL 3386544 (Ky. 2006)

Abdur'Rahman v. Bredesen, 181 S.W.3d 292 (Tenn. 2005), *cert. denied*, 126 S.Ct. 2286, 164 L.Ed.2d 813 (2006)

Coe v. Sundquist, No. M2000-00897-SC-R9-CV (Tenn.) (April 19, 2000)

State v. Webb, 252 Conn. 128, 750 A.2d 448 (2000)

Substantive Challenges to Propriety of Execution by Lethal Injection in State Capital Proceedings, 21 A.L.R. 6th 1 (2007)

Denno, Deborah, *When Legislatures Delegate Death: The Troubling Paradox Behind State Uses of Electrocution and Lethal Injection and What It Says About Us*, 63 Ohio St. L.J.63 (2002)

Appendix

- A. Executive Order No. 43
- B. Florida Governor's Commission on Administration of Lethal Injection
- C. Transcript of April 5, 2007 Public Hearing

ELECTROCUTION- CHRONOLOGICAL EXECUTION REPORT

NAME OF INMATE: Daryl K. Holton INMATE # 306263

	<u>TIME</u>	<u>TIME</u>
1. Inmate entered Execution Chamber		<u>12:59 am</u>
2. Restraints in place on inmate		<u>1:04</u>
3. Electrical Console engaged	<u> </u>	<u>1:16:10</u>
4. Electrical Console disengaged	<u> </u>	<u>1:16:58</u>
5. Visible muscular movement stopped	<u> </u>	<u>1:17</u>
6. Examined by physician	<u> </u>	<u>1:24</u>
7. Pronounced dead		<u>1:25</u>
8. Body removed from Execution Chamber		<u>1:33</u>
9. Body removed from institution		<u>1:35</u>

Electrocution Recorder

Reiny L. Bee
Warden

9/12/07
Date

9/12/07
Date

NOTE: If any step is repeated, the additional times will be recorded.

DAY OF EXECUTION - ELECTROCUTION EXECUTION RECORDER CHECKLIST

Inmate Name Daveyl K. Holton Inmate # 306263

Date 9/12/07

TIME

11:30pm Report to designated area for final briefing
11:45 Extraction Team report to Death Watch Supervisor for final briefing
12:00am Physician in place
12:00 am Medical Examiner in place
11:30 pm Team Leader in place
12:52am Check blinds and curtains
12:10 Advise Escort Officer to transport Official Witnesses to Parole Room
12:12 Advised by Escort Officer that Official Witnesses are in Parole Room
— Advise Escort Officers (2) to escort Victim's Witnesses to Viewing Room
— Advised by Escort Officers (2) that Victim's Witnesses are in place
1:07 Warden or designee checks to ensure execution is to proceed
12:57 Extraction Team enters cell and places restraints on condemned inmate
12:57 Advise Escort Officer to transport Official Witnesses to death Watch vestibule
12:58 Advised by Escort Officer that Official Witnesses are in the vestibule
1:04 Offender is secured in the chair and all restraints are in place
1:01 Advise Escort Officer to "Transport Official Witnesses in place"
1:02 Advised by Escort Officer that "Witnesses are in place"
1:08 Warden checks with Command Center to proceed

Recorder's Initial

DAY OF EXECUTION – ELECTROCUTION EXECUTION RECORDER CHECKLIST (continued)

Inmate Name Daryl K. Horton Inmate # 306263

Date 9/12/07

TIME

1:08 Warden orders blinds opened, closed circuit TV activated and audio activated for viewing rooms

1:11 Warden asks offender for any last comments

1:11 Warden orders Execution Team to proceed

1:14 Head piece and shroud is placed on the condemned inmate and the electrical cable is connected.

1:15 Warden orders the execution to proceed

1:25 "Process is completed"

1:23 Blinds and curtains closed and closed circuit TV deactivated

1:25 Physician pronounces death – exact time

1:25 Audio deactivated to witness rooms

— Advise Escort Officers (2) to remove Victims Witnesses

1:25 Advise Commissioner or designee in Command center that execution is completed

1:25 Physician departs

1:27 Medical Examiner escorted to chamber to take possession of body. Pictures will be taken of body and execution chamber prior to removal of body

— Advised by Escort Officer (2) Victims Witnesses are at Checkpoint

1:25 Advise Escort Officer to remove Official Witnesses

1:27 Advised by Escort Officer that Official Witnesses are at Checkpoint

Recorder's Initial

DAY OF EXECUTION – ELECTROCUTION EXECUTION RECORDER CHECKLIST (continued)

Inmate Name Daryl K. Holton Inmate # 306263

Date 9/12/07

TIME

<u>1:08</u>	Warden orders blinds opened, closed circuit TV activated and audio activated for viewing rooms
<u>1:11</u>	Warden asks offender for any last comments
<u>1:11</u>	Warden orders Execution Team to proceed
<u>① 1:11 / ② 1:14</u>	Head piece and shroud is placed on the condemned inmate and the electrical cable is connected. ②
<u>1:15</u>	Warden orders the execution to proceed
<u>1:25</u>	"Process is completed"
<u>1:23</u>	Blinds and curtains closed and closed circuit TV deactivated
<u>1:25</u>	Physician pronounces death – exact time
<u>1:25</u>	Audio deactivated to witness rooms
<u>—</u>	Advise Escort Officers (2) to remove Victims Witnesses
<u>1:25</u>	Advise Commissioner or designee in Command center that execution is completed
<u>1:25</u>	Physician departs
<u>1:27</u>	Medical Examiner escorted to chamber to take possession of body. Pictures will be taken of body and execution chamber prior to removal of body
<u>—</u>	Advised by Escort Officer (2) Victims Witnesses are at Checkpoint
<u>1:25</u>	Advise Escort Officer to remove Official Witnesses
<u>1:27</u>	Advised by Escort Officer that Official Witnesses are at Checkpoint

Recorder's Initial

DAY OF EXECUTION - ELECTROCUTION EXECUTION RECORDER CHECKLIST (continued)

Inmate Name Daryl K. Horton Inmate # 306263

Date 9/12/07

Offender's Comments if any:

" I did 2 terms, "

Electrocution Recorder

9/12/07
Date

Ring & Bee
Warden

9/12/07
Date

From:**To:****Date:** 6/19/2008 2:31 PM**Subject:** Re: Fwd: RFS# 329.42-011-09 (proposed DP-09-24449-00)**CC:** Bell, Ricky.J;

The line item for ELECTRICAL SERVICES should include, but not limited to the following:

1. Annual preventative maintenance, inspections, calibrations, and testing of high voltage equipment and accessory equipment (primary and secondary) as it relates to the electric chair. These services will be conducted under the supervision and guidance of the selected PE, Licenced Professional Engineer with a BSEE (Electrical Engineer).
2. The services listed in item 1 would also be requested within two days of a scheduled execution that will utilize the electric chair.
3. The PE (Professional/Electrical Engineer) could be required to be on site during the event of an execution utilizing the electric chair to supervise the preparation of the natural sponges, applications, and high voltage equipment support.
4. The PE would be required to analyze, repair, report, and make recommendations as it relates to the safe and effective use of the high voltage equipment in the event that during testing, or actual application, the chair or associated equipment experienced a malfunction or did not perform to specifications.
5. The PE could be required to provide professional consultation or witness as it relates to the protocol and/or procedures for use of the high voltage equipment and accessories in the capital punishment process.
6. The PE could be required to prepare engineering documents, reviews, reports, and/or recommendations as it relates to the safe and effective use of the high voltages equipment.

Please let me know if I can be of further assistance.

>>> 6/17/2008 9:04 AM >>>

Below you will find a copy of an e-mail from _____, in the Contract Office Review section to _____, Contract Administration. Can you please advise on the question regarding the "Execution Related Services" DPA in detail? I have attached a copy of the DPA for your perusal. I called your office on 6/17/08 and left a message regarding the same. Thanks in advance for your help and cooperation on this matter.

Tennessee Department of Correction
Contract Administration

>>> 6/13/2008 9:36 AM >>>

In the subject proposed DPA, the text in response to application item 14 includes a service category, "Electrical Services" at a maximum payment rate of \$2,500.00.

Please definitively explain (by response e-mail is fine) exactly what service(s) are included in that service category.

July 3, 2008

Warden Ricky Bell
Tennessee Department of Corrections
7475 Cockrill Bend Road
Nashville, Tennessee 37209-1048

Dear Warden Bell:

Following the inspection performed on July 1, 2008, this letter is to report that the electrocution system meets all requirements for successful operation of its intended use. If you have any further questions or need any further clarifications, please do not hesitate to contact me.

Yours very truly,

Invoice

DATE	No.
8/1/2008	80801

Bill To:
Tennessee Department of Corrections 7475 Cockrill Bend Road Nashville, Tennessee 37209-1048 Attn: .

Due Date:	Terms
9/1/2008	Net 30 Days

Project	Description	No. Sets	Date	Sq. Footage	AMOUNT
TN Department of Corrections - Consulting Services	Professional Electrical Engineering services to date	N/A	7/3/2008	N/A	\$1,470.00

Total Due	\$1,470.00
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September 7, 2013

C. Wayne Carpenter
Warden
Riverbend Maximum Security Institution
7475 Cockrill Bend Boulevard
Nashville, TN 37209-1048

Re: Electrocutation Equipment Inspection

Dear Warden Carpenter:

The annual inspection and test of the electrocutation equipment was performed on the morning of September 6, 2013. The results of this inspection and testing met the required criteria and show that the equipment will execute an inmate.

Please let me know if any further information is needed.

Sincerely,

RECEIVED

OCT 04 2013

RIVERBEND MAXIMUM
SECURITY INSTITUTION
OFFICE OF WARDEN

September 4, 2009

Ricky J. Bell
Warden
Riverbend Maximum Security Institution
7475 Cockrill Bend Boulevard
Nashville, TN 37209-1048

Re: Electrocutation Equipment Inspection

Dear Warden Bell:

The annual inspection and test of the electrocutation equipment was performed on the morning of September 3, 2009. The results of this inspection and testing met the required criteria and show that the equipment will execute an inmate.

Please let me know if any further information is needed.

Sincerely,

RECEIVED

SEP 17 2009

RIVERBEND MAXIMUM
SECURITY INSTITUTION
OFFICE OF WARDEN

State of Tennessee
Division Of Health Related Boards

This Certifies that

whose credentials have been approved by the:

BOARD OF MEDICAL EXAMINERS
has fulfilled all requirements for renewal and registration as
required by the Tennessee Code Annotated and is a duly
authorized: **MEDICAL DOCTOR**
in the State of Tennessee through **SEPTEMBER 30, 2010**



Craig A. Mc

ASSISTANT COMMISSIONER
BUREAU OF HEALTH LICENSURE & REGULATION

Renewal No.

State of Tennessee
Division Of Health Related Boards

This Certifies that

whose credentials have been approved by the:
BOARD OF MEDICAL EXAMINERS
has fulfilled all requirements for renewal and registration as
required by the Tennessee Code Annotated and is a duly
authorized: **MEDICAL DOCTOR**
in the State of Tennessee through

AUGUST 31, 2011



Way J. Davis
DIRECTOR HEALTH RELATED BOARDS