



UNITED STATES
NUCLEAR REGULATORY COMMISSION
WASHINGTON, D. C. 20555

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March 8, 1984

MEMORANDUM FOR: Roger J. Mattson, Director
Division of Systems Integration

FROM: L. S. Rubenstein, Assistant Director
for Core and Plant Systems, DSI

SUBJECT: RE-REVIEW OF GRAND GULF TECHNICAL SPECIFICATIONS

As requested by your memorandum dated February 27, 1984 we have re-reviewed the following sections of the Grand Gulf Technical Specifications, including the applicable bases section, which are in the Power Systems Branch (PSB) areas of primary responsibility.

TABLE 3.3.3-1	EMERGENCY CORE COOLING SYSTEM ACTUATION INSTRUMENTATION D. LOSS OF POWER
TABLE 3.3.3-2	EMERGENCY CORE COOLING SYSTEM ACTUATION INSTRUMENTATION SETPOINTS D. LOSS OF POWER
TABLE 4.3.3.1-1	EMERGENCY CORE COOLING SYSTEM ACTUATION INSTRUMENTATION SURVEILLANCE REQUIREMENTS D. LOSS OF POWER
3/4.8.1	A.C. SOURCES
3/4.8.2	D.C. SOURCES
3/4.8.3	ONSITE POWER DISTRIBUTION SYSTEMS
3/4.8.4	ELECTRICAL EQUIPMENT PROTECTIVE DEVICES

The Technical Specifications as written do not include the surveillance requirements for the turbine overspeed protection system. It is our understanding that these Technical Specification requirements were inadvertently deleted from the original Grand Gulf Technical Specifications

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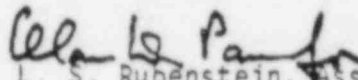
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issued in June, 1982. Therefore, we require that these Technical Specifications be reinstated into the Plant Technical Specifications. Because of the uniqueness of the Grand Gulf Turbine Generator system, the wording of the turbine overspeed protection system surveillance requirements should be the same as the Commanche Peak turbine overspeed surveillance requirements which has the same type of turbine generator system.

Based on our review, we conclude that the Grand Gulf Technical Specifications are acceptable except as noted above and in the attached marked up sections of the Technical Specification. Enclosed are copies of those specifications which have been marked with the appropriate corrections to bring them into conformance with the Standard Technical Specification and the FSAR.


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Enclosure:
As stated

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TABLE 3.3.3-1 (Continued)

EMERGENCY CORE COOLING SYSTEM ACTUATION INSTRUMENTATION

TRIP FUNCTION	MINIMUM OPERABLE CHANNELS PER TRIP FUNCTION (a)	APPLICABLE OPERATIONAL CONDITIONS	ACTION
C. DIVISION 3 TRIP SYSTEM			
1. HPCS SYSTEM			
a. Reactor Vessel Water Level - Low, Low, Level 2	4(b)	1, 2, 3, 4*, 5*	33
b. Drywell Pressure - High##	4(b)	1, 2, 3	33
c. Reactor Vessel Water Level-High, Level 8	2(c)	1, 2, 3, 4*, 5*	31
d. Condensate Storage Tank Level-Low	2(d)	1, 2, 3, 4*, 5*	34
e. Suppression Pool Water Level-High	2(d)	1, 2, 3, 4*, 5*	34
f. Manual Initiation##	1/system	1, 2, 3, 4*, 5*	32
D. LOSS OF POWER			
1. Division 1, and 2 and 3.			
a. 4.16 kV Bus Undervoltage (Loss of Voltage)	4	1, 2, 3, 4**, 5**	30
b. 4.16 kV Bus Undervoltage (BOP Load Shed)	4	1, 2, 3, 4**, 5**	30
c. 4.16 kV Bus Undervoltage (Degraded Voltage)	4	1, 2, 3, 4**, 5**	30
-2. Division 3			
a. 4.16 kV Bus Undervoltage (Loss of Voltage)	4	1, 2, 3, 4**, 5**	30
<div style="display: flex; align-items: center;"> <div style="flex: 1;"> <p>Division 3 should have three undervoltage protective relays same as Div. 1 and 2.</p> </div> <div style="flex: 1; border-left: 1px solid black; padding-left: 10px;"> <p>1, 2, 3, 4**, 5**</p> </div> </div>			
<p>(a) A channel may be placed in an inoperable status for up to 2 hours during periods of required surveillance without placing the trip system in the tripped condition provided at least one other OPERABLE channel in the same trip system is monitoring that parameter.</p> <p>(b) Also actuates the associated division diesel generator.</p> <p>(c) Provides signal to close HPCS pump discharge valve only.</p> <p>(d) Provides signal to HPCS pump suction valves only.</p> <p>(e) One out-of-two taken.</p> <p>* Applicable when the system is required to be OPERABLE per Specification 3.5.2 or 3.5.3.</p> <p>** Required when ESF equipment is required to be OPERABLE.</p> <p># Not required to be OPERABLE when reactor steam dome pressure is less than or equal to 135 psig.</p> <p>## Prior to STARTUP following the first refueling outage, the injection function of Drywell Pressure - High and Manual Initiation are not required to be OPERABLE with indicated reactor vessel water level on the wide range instrument greater than Level 8 setpoint coincident with the reactor pressure less than 600 psig.</p>			
MARKED PER FSAR			

TABLE 3.3.3-2 (Continued)

EMERGENCY CORE COOLING SYSTEM ACTUATION INSTRUMENTATION SETPOINTS

TRIP FUNCTION	TRIP SETPOINT	ALLOWABLE VALUE
D. LOSS OF POWER		
1. Division 1 and 2 and 3		
a. 4.16 kV Bus Undervoltage (Loss of Voltage)	1. 4.16 kV Basis 2912 volts 2. 120 volt Basis 83.2 volts 3. Time Delay 0.5 seconds	2912 +0, -291 volts 83.2 +0, -0.3 volts 0.6 +0.5, -0.1 seconds
b. 4.16 kV Bus Undervoltage (BOP Load Shed)	1. 4.16 kV Basis 3328 volts 2. 120 volt Basis 95.1 volts 3. Time delay 0.5 seconds	3320 +0, -167 volts 95.1 +0, -4.0 volts 0.5 +0.5, -0.1 seconds
c. 4.16 kV Bus Undervoltage (Degraded Voltage)	1. 4.16 kV Basis 3744 volts 2. 120 volt Basis 107 volts 3. Time Delay 9.0 seconds	3744 +93.6, -0 volts 107 +2.7, -0 volts 9.0 ± 0.5 seconds
2. Division 3		
a. 4.16 kV Bus Undervoltage (Loss of Voltage)	1. 4.16 kV Basis 3045 volts 2. 120 volt Basis 87 volts 3. Time Delay 2.3 seconds	3045 ± 61 volts 87 ± 1.7 volts 2.3 + 0.2, -0.3 seconds

*See Bases Figure B 3/4 3-1.

#These are inverse time delay voltage relays or instantaneous voltage relays with a time delay. The voltages shown are the maximum that will not result in a trip. Lower voltage conditions will result in decreased trip times.

MARKED PER FSAR

Deviated from the FSAR which NRC approved

TABLE 4.3.3.1-1 (Continued)
EMERGENCY CORE COOLING SYSTEM ACTUATION INSTRUMENTATION SURVEILLANCE REQUIREMENTS

TRIP FUNCTION	CHANNEL CHECK	CHANNEL FUNCTIONAL TEST	CHANNEL CALIBRATION	OPERATIONAL CONDITIONS FOR WHICH SURVEILLANCE REQUIRED
B. DIVISION 2 TRIP SYSTEM (Continued)				
2. AUTOMATIC DEPRESSURIZATION SYSTEM				
TRIP SYSTEM "B" #				
a. Reactor Vessel Water Level - Low Low Low, Level 1	S	M	R ^(a)	1, 2, 3
b. Drywell Pressure-High	S	M	R ^(a)	1, 2, 3
c. ADS Timer	NA	M	Q	1, 2, 3
d. Reactor Vessel Water Level - Low, Level 3	S	M	R ^(a)	1, 2, 3
e. LPCI Pump B and C Discharge Pressure-High	S	M ^(b)	R ^(a)	1, 2, 3
f. Manual Initiation	NA	R ^(b)	NA	1, 2, 3
C. DIVISION 3 TRIP SYSTEM				
1. HPCS SYSTEM				
a. Reactor Vessel Water Level - Low Low, Level 2	S	M	R ^(a)	1, 2, 3, 4*, 5*
b. Drywell Pressure-High##	S	M	R ^(a)	1, 2, 3
c. Reactor Vessel Water Level-High, Level 8	S	M	R ^(a)	1, 2, 3, 4*, 5*
d. Condensate Storage Tank Level - Low	S	M	R ^(a)	1, 2, 3, 4*, 5*
e. Suppression Pool Water Level - High	S	M ^(b)	R ^(a)	1, 2, 3, 4*, 5*
f. Manual Initiation##	NA	R ^(b)	NA	1, 2, 3, 4*, 5*
D. LOSS OF POWER				
1. Division 1 and 2 and 3				
a. 4.16 kV Bus Undervoltage (Loss of Voltage)	NA	M ^(e)	R	1, 2, 3, 4**, 5**
b. 4.16 kV Bus Undervoltage (BOP Load Shed)	NA	M ^(e)	R	1, 2, 3, 4**, 5**
c. 4.16 kV Bus Undervoltage (Degraded Voltage)	NA	M ^(e)	R	1, 2, 3, 4**, 5**
2. Division 3				
a. 4.16 kV Bus Undervoltage (Loss of Voltage)	NA	NA	R	1, 2, 3, 4**, 5**

Division 3 should have three
undervoltage protective
relays same as Div. 1 and 2.

PER FSAR

3/4.8 ELECTRICAL POWER SYSTEMS

3/4.8.1 A.C. SOURCES

A.C. SOURCES - OPERATING

LIMITING CONDITION FOR OPERATION

3.8.1.1 As a minimum, the following A.C. electrical power sources shall be OPERABLE:

- a. Two physically independent circuits between the offsite transmission network and the onsite Class 1E distribution system, and
- b. Three separate and independent diesel generators, each with:
 1. Separate day fuel tanks containing a minimum of 220 gallons of fuel.
 2. A separate fuel storage system containing a minimum of:
 - a) 48,000 gallons of fuel each for diesel generators 11 and 12, and
 - b) 39,000 gallons of fuel for diesel generator 13.
 3. A separate fuel transfer pump.

APPLICABILITY: OPERATIONAL CONDITIONS 1, 2, and 3.

ACTION:

- a. With either one offsite circuit or diesel generator 11 or 12 of the above required A.C. electrical power sources inoperable, demonstrate the OPERABILITY of the remaining A.C. sources by performing Surveillance Requirements 4.8.1.1.1.a ~~within one hour~~ and 4.8.1.1.2.a.4, ~~for one diesel generator at a time~~, within ^{one hour} ~~three hours~~ and at least once per 8 hours thereafter; restore at least two offsite circuits and diesel generators 11 and 12 to OPERABLE status within 72 hours or be in at least HOT SHUTDOWN within the next 12 hours and in COLD SHUTDOWN within the following 24 hours.
- b. With one offsite circuit and diesel generator 11 or 12 of the above required A.C. electrical power sources inoperable, demonstrate the OPERABILITY of the remaining A.C. sources by performing Surveillance Requirements 4.8.1.1.1.a ~~within one hour~~ and 4.8.1.1.2.a.4, ~~for one diesel generator at a time~~, within ^{one hour} ~~two hours~~ and at least once per 8 hours thereafter; restore at least one of the inoperable A.C. sources to OPERABLE status within 12 hours or be in at least HOT SHUTDOWN within the next 12 hours and in COLD SHUTDOWN within the following 24 hours. Restore at least two offsite circuits and diesel generators 11 and 12 to OPERABLE status within 72 hours from time of initial loss or be in at least HOT SHUTDOWN within the next 12 hours and in COLD SHUTDOWN within the following 24 hours.

* marked-up is in accordance with Standard Tech. Spec.

ELECTRICAL POWER SYSTEMS

LIMITING CONDITION FOR OPERATION (Continued)

ACTION (Continued)

- c. With either diesel generator 11 or 12 of the above required A.C. electrical power sources inoperable, in addition to ACTION a or b, above as applicable, verify within 2 hours that all required systems, subsystems, trains, components and devices that depend on the remaining diesel generator 11 or 12 as a source of emergency power are also OPERABLE; otherwise, be in at least HOT SHUTDOWN within the next 12 hours and in COLD SHUTDOWN within the following 24 hours.
- d. With two of the above required offsite circuits inoperable, demonstrate the OPERABILITY of three diesel generators by performing Surveillance Requirement 4.8.1.1.2.a.4, ~~for one diesel generator at a time~~, within ^{one hour} three hours and at least once per 8 hours thereafter, unless the diesel generators are already operating; restore at least one of the inoperable offsite circuits to OPERABLE status within 24 hours or be in at least HOT SHUTDOWN within the next 12 hours. With only one offsite circuit restored to OPERABLE status, restore at least two offsite circuits to OPERABLE status within 72 hours from time of initial loss or be in at least HOT SHUTDOWN within the next 12 hours and in COLD SHUTDOWN within the following 24 hours.
- e. With diesel generators 11 and 12 of the above required A.C. electrical power sources inoperable, demonstrate the OPERABILITY of the remaining A.C. sources by performing Surveillance Requirements 4.8.1.1.1.a and 4.8.1.1.2.a.4 within one hour and at least once per 8 hours thereafter; restore at least one of the inoperable diesel generators 11 and 12 to OPERABLE status within 2 hours or be in at least HOT SHUTDOWN within the next 12 hours and in COLD SHUTDOWN within the following 24 hours. Restore both diesel generators 11 and 12 to OPERABLE status within 72 hours from time of initial loss or be in at least HOT SHUTDOWN within the next 12 hours and in COLD SHUTDOWN within the following 24 hours.
- f. With diesel generator 13 of the above required A.C. electrical power sources inoperable, demonstrate the OPERABILITY of the remaining A.C. sources by performing Surveillance Requirements 4.8.1.1.1.a ~~within one hour~~ and ^{one hour} 4.8.1.1.2.a.4, ~~for one diesel generator at a time~~, within ~~two hours~~ and at least once per 8 hours thereafter; restore the inoperable diesel generator 13 to OPERABLE status within 72 hours or declare the HPCS system inoperable and take the ACTION required by Specification 3.5.1.

* Marked-up is in accordance with S.T.S.

- 15227 A.
- c. At least once per quarter or on a monthly basis [if the ground water table is equal to or higher than the bottom of the tank] by checking for and removing accumulated water from the fuel oil storage tanks.
 - d. At least once per 92 days and from new fuel prior to addition to the storage tanks, by obtaining a sample of fuel oil in accordance with ASTM-D270-1975, and by verifying that the sample meets the following minimum requirements and is tested within the specified time limits:
 1. As soon as sample is taken (or prior to adding new fuel to the storage tank) verify in accordance with the tests specified in ASTM-D975-77 that the sample has:
 - a) A water and sediment content of less than or equal to 0.05 volume percent.
 - b) A kinematic viscosity @ 40°C of greater than or equal to 1.9 centistokes, but less than or equal to 4.1 centistokes.
 - c) A specific gravity as specified by the manufacturer @ 60/60°F of greater than or equal to _____ but less than or equal to _____ or an API gravity @ 60°F of greater than or equal to _____ degrees but less than or equal to _____ degrees.
 2. Within one week after obtaining the sample, verify an impurity level of less than 2 mg of insolubles per 100 ml. When tested in accordance with ASTM-D2274-70.
 3. Within two weeks of obtaining the sample verify that the other properties specified in Table 1 of ASTM-D975-77 and Regulatory Guide 1.137 Position 2.a are met when tested in accordance with ASTM-D975-77.

This page should be included in T.S.
PER STANDARD TEST SPEC

ELECTRICAL POWER SYSTEMS

SURVEILLANCE REQUIREMENTS (Continued)

At least once per 92 days and from new oil prior to addition to the storage tanks by verifying that a sample obtained in accordance with ASTM-D270-1975 has a water and sediment content of less than or equal to .05 volume percent and a kinematic viscosity @ 40°C of greater than or equal to 1.9 but less than or equal to 4.1 when tested in accordance with ASTM-D975-77, and an impurity level of less than 2 mg. of insolubles per 100 ml. when tested in accordance with ASTM-D2274-70, except that the test of new fuel for impurity level shall be performed within 7 days after addition of the new fuel to the storage tank.

e. At least once per 18 months, during shutdown, by:

1. Subjecting the diesel to an inspection in accordance with procedures prepared in conjunction with its manufacturer's recommendations for this class of standby service.
2. Verifying the diesel generator capability to reject a load of greater than or equal to ~~1200~~ ¹⁵⁰⁰ kW (LPCS Pump) for diesel generator 11, greater than or equal to ~~550~~ ⁵⁵⁰ kW (RHR B/C Pump) for diesel generator 12, and greater than or equal to ~~2100~~ ²¹⁰⁰ kW (HPCS Pump) - 2780 for diesel generator 13 while maintaining less than or equal to 75% of the difference between nominal speed and the overspeed trip setpoint, or 15% above nominal, whichever is less.
3. Verifying the diesel generator capability to reject a load of 7000 kW for diesel generators 11 and 12 and 3300 kW for diesel generator 13 without tripping. The generator voltage shall not exceed ~~5000~~ ⁴⁷⁸⁴ volts during and following the load rejection.
4. Simulating a loss of offsite power by itself, and:
 - a) For Divisions 1 and 2:
 - 1) Verifying deenergization of the emergency busses and load shedding from the emergency busses.
 - 2) Verifying the diesel generator starts on the auto-start signal, energizes the emergency busses with permanently connected loads within 10 seconds, energizes the auto-connected shutdown loads through the load sequencer and operates for greater than or equal to 5 minutes while its generator is loaded with the shutdown loads. After energization, the steady state voltage and frequency of the emergency busses shall be maintained at 4160 ± 416 volts and 60 ± 1.2 Hz during this test.
 - b) For Division 3:
 - 1) Verifying de-energization of the emergency bus.
 - 2) Verifying the diesel generator starts on the auto-start signal, energizes the emergency bus with the loads within 10 seconds and operates for greater than or equal to 5 minutes while its generator is loaded with the shutdown loads. After energization, the steady state voltage and frequency of the emergency bus shall be maintained at 4160 ± 416 volts and 60 ± 1.2 Hz during this test.

ELECTRICAL POWER SYSTEMS

SURVEILLANCE REQUIREMENTS (Continued)

8. Verifying that all automatic diesel generator trips are automatically bypassed upon an ECCS actuation signal except:
- For Divisions 1 and 2, engine overspeed ^{and} generator differential current, ~~low lube oil pressure, and generator ground overcurrent.~~
 - For Division 3, engine overspeed and generator differential current.
9. Verifying the diesel generator operates for at least 24 hours. During the first 2 hours of this test, the diesel generator shall be loaded to greater than or equal to 7700 kW for diesel generators 11 and 12 and 3630 kW for diesel generator 13 and during the remaining 22 hours of this test, the diesel generator shall be loaded to 7000 kW for diesel generators 11 and 12 and 3300 kW for diesel generator 13. The generator voltage and frequency shall be 4160 ± 416 volts and 60 ± 1.2 Hz within 10 seconds after the start signal; the steady state generator voltage and frequency shall be maintained within these limits during this test. Within 5 minutes after completing this 24-hour test, perform Surveillance Requirement 4.8.1.1.2.d.7.a).2) and b).2)*.
10. Verifying that the auto-connected loads to each diesel generator do not exceed the continuous rating of 7000 kW for diesel generators 11 and 12 and 3300 kW for diesel generator 13.
11. Verifying the diesel generator's capability to:
- Synchronize with the offsite power source while the generator is loaded with its emergency loads upon a simulated restoration of offsite power,
 - Transfer its loads to the offsite power source, and
 - Be restored to its standby status.
12. Verifying that with the diesel generator operating in a test mode and connected to its bus that a simulated ECCS actuation signal:
- ~~For Divisions 1 and 2,~~ ^{and 3,} overrides the test mode by ⁽¹⁾ returning the diesel generator to standby operation, ^{and (2)} automatically ~~energizing the emergency loads with offsite power.~~
 - ~~For Division 3, overrides the test mode by bypassing the diesel generator automatic trips per Surveillance Requirement 4.8.1.1.2.d.8.b).~~
13. Verifying that with all diesel generator air start receivers pressurized to less than or equal to 256 psig and the compressors secured, the diesel generator starts at least 5 times from ambient conditions and accelerates to at least 441 rpm for diesel generators 11 and 12 and 882 rpm for diesel generator 13 in less than or equal to 10 seconds.

* If Surveillance Requirement 4.8.1.1.2.d.4.a)2) or b)2) are not satisfactorily completed, it is not necessary to repeat the preceding 24 hour test. Instead, the diesel generator may be operated at rated load for one hour or until operating temperatures have stabilized.

ELECTRICAL POWER SYSTEMS

SURVEILLANCE REQUIREMENTS (Continued)

14. Verifying that the fuel transfer pump transfers fuel from each fuel storage tank to the day tank of each diesel via the installed lines.
15. Verifying that the automatic load sequence timer is OPERABLE with the interval between each load block within $\pm 10\%$ of its design interval for diesel generators 11 and 12.
16. Verifying that the following diesel generator lockout features prevent diesel generator starting and/or trip the diesel generator only when required:
 - a) Generator loss of excitation.
 - b) Generator reverse power.
 - c) High jacket water temperature.
 - d) Generator overcurrent with voltage restraint.
 - e) Bus underfrequency (11 and 12 only).
 - f) Engine bearing temperature high (11 and 12 only).
 - g) Low turbo charger oil pressure (11 and 12 only).
 - h) High vibration (11 and 12 only).
 - i) High lube oil temperature (11 and 12 only).
 - j) Low lube oil pressure (13 only).
 - k) High crankcase pressure.

f. At least once per 10 years or after any modifications which could affect diesel generator interdependence by starting all three diesel generators simultaneously, during shutdown, and verifying that the three diesel generators accelerate to at least 441 rpm for diesel generators 11 and 12 and 882 rpm for diesel generator 13 in less than or equal to 10 seconds.

g. At least once per 10 years by:

1. Draining each fuel oil storage tank, removing the accumulated sediment and cleaning the tank using a sodium hypochlorite or equivalent solution, and
2. Performing a pressure test of those portions of the diesel fuel oil system designed to Section III, subsection ND of the ASME Code in accordance with ASME Code Section 11, Article IWD-5000.

4.8.1.1.3 Reports - All diesel generator failures, valid or non-valid, shall be reported to the Commission pursuant to Specification 6.9.1. Reports of diesel generator failures shall include the information recommended in Regulatory Position C.3.b of Regulatory Guide 1.108, Revision 1, August 1977. If the number of failures in the last 100 valid tests, on a per nuclear unit basis, is greater than or equal to 7, the report shall be supplemented to include the additional information recommended in Regulatory Position C.3.b of Regulatory Guide 1.108, Revision 1, August 1977.

ELECTRICAL POWER SYSTEMS

SURVEILLANCE REQUIREMENTS

4.8.2.1 Each of the above required 125-volt batteries and chargers shall be demonstrated OPERABLE:

- a. At least once per 7 days by verifying that:
 1. The parameters in Table 4.8.2.1-1 meet the Category A limits, and
 2. Total battery terminal voltage is greater than or equal to 129-volts on float charge.
- b. At least once per 92 days and within 7 days after a battery discharge with battery terminal voltage below 110-volts, or battery overcharge with battery terminal voltage above 150-volts, by verifying that:
 1. The parameters in Table 4.8.2.1-1 meet the Category B limits,
 2. There is no visible corrosion at either terminals or connectors, or the connection resistance of these items is less than 150×10^{-6} ohms, and
 3. The average electrolyte temperature of every sixth connected cells is above 60°F.
- c. At least once per 18 months by verifying that:
 1. The cells, cell plates and battery racks show no visual indication of physical damage or abnormal deterioration,
 2. The cell-to-cell and terminal connections are clean, tight, free of corrosion and coated with anti-corrosion material,
 3. The resistance of each cell and terminal connection is less than or equal to 150×10^{-6} ohms, and
 4. The battery charger will supply:
 - a) For Divisions 1 and 2, at least 400 amperes at a minimum of ~~125~~ volts for at least ~~2~~ hours.
125
 - b) For Division 3, at least 50 amperes at a minimum of ~~125~~ volts for at least ~~2~~ hours.
125

"marked-up" is in accordance with STS.