PART 1 - GENERAL

1.1 SCOPE OF WORK

.1 This section relates to all low tension systems and equipment.

.2 Commission all low tension systems and equipment; refer to the applicable sections for specific commissioning procedures and specific requirements by the Departmental Representative. Submit commissioning reports and test results to the Departmental Representative where indicated.

.3 Follow manufacturer recommendations, installation, and start-up procedures.

.4 Record all test results, complete and store all commissioning reports; also include any quality control issues, code violations, material substitutions, poor workmanship, and apparent damage. Upon request by the Departmental Representative, submit commissioning reports and test results for review.

1.2 ELECTRONIC EQUIPMENT

.1 Electronic components forming parts of computerized equipment and system controls are sensitive to transients in electrical power lines and to short duration power outages. Provide protection against disruption caused by these conditions.

.2 Many electronic loads are nonlinear. AC to DC convertors (rectifiers) and switching mode power supplies are examples of loads in which the load current is not proportional to the instantaneous voltage, or is discontinuous. Such nonlinear loads create considerable harmonic distortion on the electrical system supplying the loads, even when the source voltage is a clean sine wave. The nonlinear loads will distort that voltage wave, making it non-sinusoidal. Prevent this effect.

.3 Computerized equipment may generate spurious emissions in the form of conducted and radiated electrical/ electromagnetic interference. The operation of sensitive electronic equipment may be impeded by such omissions. Ensure that electromagnetic compatibility is complied with.

1.2 ELECTRONIC EQUIPMENT (Cont'd)

.4 For each and every system specified in Division 27, provide single line riser diagram depicting room location of every device in the system and mount diagram in suitably sized glass frame mounted adjacent to respective main control cabinet.

1.3 TRANSIENT PROTECTION

.1 The system shall be protected against transients in the power system and in the communication and signalling lines (i.e. spikes, glitches or surges).

.2 The protection shall be for both common and differential modes.

.3 The protection shall comply with the requirements of IEEE Standard 472 (ANSI/IEEE C37.90) titles "Guide For Surge Withstand Capability Tests".

.4 The manufacturer shall install the devices within their equipment enclosure or case, and clearly label or otherwise identify the components used.

1.4 MEMORY PROTECTION

.1 Provide protection against memory loss due to short duration power failures.

.2 This protection shall take the form of an internal auxiliary power supply for microprocessor and memory components unless it is built from non-volatile components.

.3 The equipment involved shall retain its status during interruptions lasting up to 20 seconds. It shall not be necessary to reload, reset or reprogram such equipment.

.4 The equipment is not expected to continue functioning during the power outage. Indicating lights and other signals may cease momentarily. However, upon power restoration (either normal or emergency) shall regain its status and resume its operation with no ill effect due to the interruption.

.5 The equipment shall indicate failure of the auxiliary power supply by pilot light, message or other acceptable means.

1.5 NON-LINEAR LOADS

.1 Provide line filters to reduce the harmonic content of non-linear loads. Such filters shall be mounted inside the equipment enclosure (the enclosure shall be increased in size if necessary) and shall limit the total Distortion Factor (harmonic factor) to 3% as defined and measured in ANSI/IEEE Std 519 titled: "Guide for Harmonic Control and Reactive Compensation of Static Power Converters."

1.6 ELECTRO-MAGNETIC COMPATIBILITY

.1 Emission Limits:

.1 Equipment emission of electromagnetic radiation shall be limited to Class-B of FCC RULES PART-15 subpart - J as tested in accordance with FCC measurements procedure MP-4 titled: "FCC measurement of Radio Noise Emission from Computing Devices".

.2 The Departmental Representative shall be notified where the above requirement cannot be met. The Departmental Representative may authorize class-A qualification or any other qualification of limited electromagnetic emission.

.2 Susceptibility Limits:

.1 Equipment shall perform normally in presence of electromagnetic field of one V/m in accordance with ANSI/IEEE C63.12 titled: "Recommended Practice on Procedures for Control of System Electromagnetic Compatibility".

.2 The susceptibility to power conducted emission of electromagnetic radiation shall be one volt as defined and measured in the standard in 1.5.2.1.

.3 Equipment shall be capable of performing on supply systems containing notches without false triggering of circuits. This should be for notch depth of 0.7 of the rated maximum line voltage and width of 250 microseconds as stipulated in the standard in 1.4.1.

.3 The Departmental Representative shall be notified where equipment does not meet the requirements in 1.6.2 so that corrective measures can be sought.

PART 2 - PRODUCTS

2.1 NOT USED .1 Not Used.

PART 3 - EXECUTION

3.1 NOT USED .1 Not Used.