

NTPC	LMI	LARA
TITLE	TESTING OF ELECTRICAL PROTECTION SYSTEM	
REF. NO.	LMI 01-R0/ELEC/OD/OPS/ELEC/003	

**LARA SUPER THERMAL POWER PROJECT
LOCAL MANAGEMENT INSTRUCTION**

LMI 01-R0/ELEC/OD/OPS/ELEC/003

Testing of Electrical Protection System



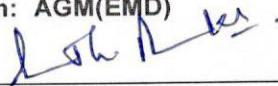
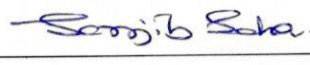
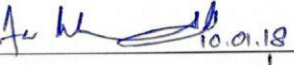
All locations are required to comply with this Directive

Approved for Implementation by
HOP(LARA)

Date : 11/01/2018

Enquiries to : HOD(Elect.)

NTPC	LMI	LARA
TITLE	TESTING OF ELECTRICAL PROTECTION SYSTEM	
REF. NO.	LMI 01-R0/ELEC/OD/OPS/ELEC/003	

1	TITLE OF LMI	TESTING OF ELECTRICAL PROTECTION SYSTEM
2	DOCUMENT CODE	LMI 01-R0/ELEC/OD/OPS/ELEC/003
3	REVISION NO/DATE	
4	ORIGINAL/REF. DOCUMENT	COS-ISO- OD/OPS/ELEC/003 Issue No. 1, Oct, 1994
5	PREPARED BY	Name: Partha Mukherjee Designation: AGM(EMD) Signature: 
6	CHECKED BY	Name: Sanjib Kumar Saha Designation: AGM(EMD) Signature: 
7	RECHECKED BY	Name: Sunil Kumar Designation: GM(Maint) Signature:  10.01.18
8	REVIEWED BY	Name: R K Rout Designation: GM(O&M) Signature:  10/01/2018
9	APPROVED BY	Name: Sanjay Madan Designation: HOP Lara Signature: 
10	DATE OF ISSUE	11/01/2018
11	CONTENTS LIST	Enclosed
12	DISTRIBUTION LIST	Enclosed

NTPC	LMI	LARA
TITLE	TESTING OF ELECTRICAL PROTECTION SYSTEM	
REF. NO.	LMI 01-R0/ELEC/OD/OPS/ELEC/003	

CONTENTS

S.No.	DESCRIPTION	PAGE NO.
1.0	Introduction	4
2.0	Superseded Documents	4
3.0	Scope	4
4.0	Requirements	4
5.0	Review	6
6.0	Review Records	7
7.0	Distribution List	7

L. N. K.

NTPC	LMI	LARA
TITLE	TESTING OF ELECTRICAL PROTECTION SYSTEM	
REF. NO.	LMI 01-R0/ELEC/OD/OPS/ELEC/003	

TESTING OF ELECTRICAL PROTECTION SYSTEM

1.0 INTRODUCTION

This LMI is being issued in order to comply with operation directive OD/OPS/ELEC/003, Issue - 1, dtd. October 1994.

An electrical protection system is needed to act and disconnect as speedily as possible any element of the power system in which a fault has developed. The protection system must be highly selective and discriminatory. A fully functional electrical protection system is necessary to achieve the highest degree of integrity, reliability and availability of the equipment.

A suitable level of regular testing is necessary to ensure that the reliability of the protection system performance so as to achieve the following:

- i. Minimise the plant damage under fault conditions.
- ii. Minimise the likelihood of unnecessary tripping.
- iii. Maximize the safety of individuals.

2.0 SUPERSEDED DOCUMENTS

NIL

3.0 SCOPE

All protection used in switchgear, generators, transformers, motors, and other electrical equipment which acts on sensing abnormal electrical parameters.

4.0 REQUIREMENTS

Protection System testing for electrical equipment/devices, can be grouped into the following: -

[Handwritten signature]

NTPC	LMI	LARA
TITLE	TESTING OF ELECTRICAL PROTECTION SYSTEM	
REF. NO.	LMI 01-R0/ELEC/OD/OPS/ELEC/003	

4.1 Primary Testing

To ensure the satisfactory operation of the equipment during service, primary testing is carried out by subjecting the equipment to the rated level of stresses. Manufacturers recommendations on limiting values/conditions shall be strictly followed. Since Primary testing involve a high level of voltages/currents, the special precautions with regard to the safety of man and machinery is essential.

4.2 Secondary Testing

Secondary Testing involves the testing of equipment/devices used for protecting the main equipment i.e. cables, CT'S, PT'S, relays, switches, etc.

This testing requires low voltage and low current injection. The complexities of different schemes and their interfacing with each other, require special precautions in isolating the equipment under test.

Approved testing formats shall be used which specify the stress experienced during the test in terms of Voltage, Current, frequency, time etc, and the maximum recommended allowable limits.

4.3 Dynamic Testing

Once the primary and secondary testing of different components of unit have been successfully completed, the dynamic testing shall be performed to confirm the overall performance and stability of different interconnected systems of the Unit.

Since the dynamic testing is carried out when the system is in an energized condition, all necessary plant conditions shall be specified in advance, and full precautions shall exercise with defined responsibilities.

4.4 Functional Testing

Functional testing of all equipment, schemes, interlocks, inter-trips, alarms and interfacing with DAS, etc, shall be checked by performing a simulation or actual

LSH

NTPC	LMI	LARA
TITLE	TESTING OF ELECTRICAL PROTECTION SYSTEM	
REF. NO.	LMI 01-R0/ELEC/OD/OPS/ELEC/003	

test (if possible) at regular intervals. These checks are also to be performed after any indiscriminate tripping/operation.

4.5 Schedule of Testing

All the envisaged modes of test shall be performed by the Testing & Maintenance Departments. Deviations, if any, shall be clearly recorded and approved by head of O&M.

Testing of

1	All line protection, Unit, generator protections, switchgear protection, interlocks, alarms, SOE's etc.	During Unit Overhaul or any shutdown available for 10 days or more after completion of 1 year from the last testing.
2	Main Equipment such as generators, bay equipment, transformers, breakers, etc.	During unit overhaul or after any major work on the equipment.
3	Dynamic Testing such as SCC/OCC, AVR response changeover schemes etc.	After Unit overhaul.
4	Off site and common station auxiliary equipment, switchgear, protection, etc.	After completion of 1 year from the last testing.

5.0 REVIEW

The HOD (EMD), will be responsible for reviewing this document every three years or as necessary

Signature

NTPC	LMI	LARA
TITLE	TESTING OF ELECTRICAL PROTECTION SYSTEM	
REF. NO.	LMI 01-R0/ELEC/OD/OPS/ELEC/003	

6.0 REVIEW RECORDS

S.no	Date	Reviewed by	Signature	Comments

7.0 DISTRIBUTION LIST

SL NO.	DATE OF ISSUE	ISSUED TO
1		HOP LARA
2		GM (O&M)
3		AGM (EMD)
4		AGM (EEMG)
5		AGM (OPERATION)

L. S. H. K.