

## Lightning Protection Risk Assessment Study:

### 1.0 Introduction:

Lightning Protection Study is highly site-specific, with many designs unique to individual facilities and structures. Mitigation of the effects of lightning strikes is attempted through the deployment of a combination of exterior and interior defenses.

Cholamandalam MS Risk Services Limited (CMSRS) has carried out Lightning Protection Studies for a variety of process / petrochemical industries and this document outlines the objective, scope, methodology adopted for Lightning Protection Risk Assessment Study and the firm's capability in carrying out the study.

### 2.0 Objectives:

The objectives of the lightning protection study is to

- ❖ Review the existing lightning protection system against national and international standards
- ❖ Study of the maintenance aspects of the lightning protection system and suggest suitable corrective actions.

### 3.0 Scope of the study

The lightning protection study would be based on the following national and international standards. The study would also include review of existing lightning protection installation in the plant.

- ❑ **Indian Standard 2309** – Code of Practice on Lightning Protection of Buildings & Allied Structures
- ❑ **National Fire Protection Association** (NFPA) 780
- ❑ **Oil Industry Safety Directorate** (OISD) 180
- ❑ **British Standard** on Lightning Protection (BS 6651)
- ❑ **American Petroleum Institute** (API) RP 2003 -Lightning protection Standard

#### **Surge Protection:**

CMSRSL would address the surge protection issues as part of the LP Risk assessment study. If Cairn Energy is interested, a surge protection survey by a reputed manufacturer can be arranged.

#### **Salient features of the study:**

- (a) Assessment of **lightning protection requirement** for all plant blocks based.
- (b) Verification of installation **compliance against standards** and to suggest corrective measures

- (c) Review of the [maintenance standards and procedures](#) of the existing lightning protection system
- (d) Plotting of [lightning protection zones](#) in the plant layout.

**Software Used:**

CMSRSL would use Lightning Protection Risk Assessment software (conforming to BS 6651 standard) for assessing the lightning risk value for each plant block.

#### **4.0 Methodology**

Our approach differs from that offered by many other companies, we focus on the management systems that make sure your risks are properly controlled. In this way we can make sure you have “designed-in” good safety management. This approach can be compared to Total Quality Management methods that are widely recognized as being the most effective way to provide high quality.

Other approaches rely on “inspecting out” problems and generally offer only a short-term solution. When compared with other approaches “total” management approaches are very cost effective. They do not rely on expensive additional resources or controls but ensure that safety management is part of the normal business processes.

Lightning Protection Study is conducted in four principal phases

- Preparation
- On-site audit
- Reporting
- Follow-up

After the objectives and scope of the study are accepted next step would be collection of information. A detailed description of type of data that need to be collected is sent on acceptance of this proposal.

After analysing the information by the audit team members a schedule is prepared after discussing with the factory management. Site study will be undertaken on mutual convenience.

## 5.0 Reporting Format:

The detailed report would provide recommendations for each of the individual plant block. The recommendations would be provided in the form of table as shown below:

<i>Structure / Building</i>	<i>Existing LP System</i>	<i>Recommended LP System Elements</i>			<i>Comments</i>
		<i>Air Termination</i>	<i>Down Conductor &amp; Test Links</i>	<i>Earth Pits</i>	
<b><u>Specific Recommendations:</u></b>					

Also the each structure would be ranked High, Medium or Low for implementation of the recommendations as per the following criterion:

<b>Priority</b>	<b>Criterion</b>
<b>High</b>	Structure where lightning protection is REQUIRED
<b>Medium</b>	Structure where lightning protection is RECOMMENDED
<b>Low</b>	Structure where lightning protection is NOT REQUIRED

## 6.0 Personnel

CMSRSL will use personnel who are experienced and have carried out similar work for other companies. *A senior CMSRSL consultant who is trained by National Lightning Safety Institute, USA and well versed with carrying out Lightning Protection Studies will head the audit team.* The team will contain two senior engineers who are well versed with lightning protection assessment of major chemical & petro-chemical plants.

CMSRSL has carried out Lightning Risk Assessment Studies for the following clients:

1. Bombay Dyeing Limited, Patalganga
2. Hind Lever Chemicals, Haldia
3. TI Diamond Chain Limited
4. Mangalore Refinery and Petrochemicals Limited, Mangalore
5. Bharat Petroleum Corporation Limited, Manmad
6. Orchid Chemicals and Pharmaceuticals Limited
7. Shasun Drugs and Chemicals Limited

*While projects 1,2 and 3 mentioned above are specific LP Risk Assessment studies 4,5,6 and 7 were Electrical Safety Studies where Lightning Protection was addressed as part of the project.*

In addition to the above, CMSRSL executed safety related projects for major petrochemical / process industries like

- Hindustan Petroleum Corporation Limited, Vizag Refinery
- Chennai Petroleum Corporation Limited, Manali Refinery
- Bharat Petroleum Corporation Limited – LPG Bottling Plant, Mangalore
- Bharat Petroleum Corporation Limited – Mangalore Coastal Installation
- Hindustan Petroleum Corporation Limited – Mangalore LPG Import Facility
- Hindustan Petroleum Corporation Limited – LPG Bottling Plant
- Indian Oil Corporation Limited, POL Terminal, Mangalore
- Bharat Petroleum Corporation Limited, LPG Bottling Plant, Coimbatore
- Hindustan Petroleum Corporation Limited, POL Terminal, Coimbatore
- Indian Oil Corporation Limited, POL Terminal, Coimbatore
- Chambal Fertilizers and Chemicals Limited, Kota, Rajasthan

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