DESIGN PHILOSOPHY FOR FIRE ALARM & DETECTION SYSTEM
<table>
<thead>
<tr>
<th>Section</th>
<th>Title</th>
<th>Page</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.0</td>
<td>Content</td>
<td>2-2</td>
</tr>
<tr>
<td>2.0</td>
<td>Introduction</td>
<td>3-3</td>
</tr>
<tr>
<td>3.0</td>
<td>Intent</td>
<td>3-3</td>
</tr>
<tr>
<td>4.0</td>
<td>Scope of Work</td>
<td>3-3</td>
</tr>
<tr>
<td>5.0</td>
<td>System Component overview</td>
<td>4-4</td>
</tr>
<tr>
<td>6.0</td>
<td>Operation Philosophy</td>
<td>4-5</td>
</tr>
</tbody>
</table>
2.0 **INTRODUCTION:**

In order to combat any occurrence of fire in the premises of GIS Room, Addressable fire alarm and detection system is provided along with other fire fighting system for the early detection of fire.

In every fire event, smoke is the first clue. In smoldering fire, for a long time it is the only clue. Since fire starts in a small way in early stage and thereafter develops rapidly. Therefore it is most importance to detect the fire at its incipient stage; thereby it should be brought into control before bursting it into flames and causing fire damage.

*The Critical factor of effective fire protection is therefore an early warning of “Fire” by means of Fire Alarm and Detection System.*

For Detecting smoke produced in the incipient stage of fire, modern technology has developed detectors working on various principals for early and accurate indication of Fire in all Areas. The Detector detects smoke and when connected to a suitable Control Panel, initiates an Audio Visual Alarm on the Control Panel to indicate occurrence of Fire and its location. It is also possible to actuate various Fire Fighting Systems through addressable interfacing units.

The installation consists of an early warning Fire Alarm System using Addressable Multi criteria type detector with Fire Alarm Control Panel. Additional equipments like manually operated Pull station, Hooters, etc. are also provided to convey the manually detected fire signal to Control Panel, visual indication of fire and spotting of fire respectively. It is also possible to have graphical Indication of Fire / Fault in Computer Screen through adequate graphical software and we can also maintain the log of fire is well. The printout of all events in Fire Alarm & Detection System can also be possible by connecting the printer with the system.

3.0 **INTENT:**

The objective of this report is to formulate & finalize the scope of areas to be protected, type and design parameter of the major components of Intelligent Addressable Fire Alarm & Detection as per TAC / NFPA72 / IS 2189 standard.

4.0 **SCOPE OF WORK:**

The different areas to be covered under microprocessor based Intelligent Addressable fire alarm & detection system are as follows.

**AREAS PROTECTED BY ADDRESSABLE FIRE ALARM SYSTEM**

a) GIS Room
5.0 **SYSTEM COMPONENT OVERVIEW:**

<table>
<thead>
<tr>
<th>Sr. No.</th>
<th>Item Description</th>
<th>Application</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Addressable Fire Alarm &amp; Control Panel</td>
<td>For Detection of Fire and actuation of various fire extinguishing systems</td>
</tr>
<tr>
<td>2</td>
<td>Addressable Multi-Criteria Type Detector</td>
<td>For Detection of Smoldering type fire With cross checking of temperature</td>
</tr>
<tr>
<td>3</td>
<td>Addressable Manual Call Point</td>
<td>For the indication of Manually detected Fire</td>
</tr>
<tr>
<td>4</td>
<td>Addressable type Control Module</td>
<td>For actuating the outer Device from Fire Alarm &amp; Control Panel (For Example Hooter, SOV etc.)</td>
</tr>
<tr>
<td>5</td>
<td>Addressable type Monitor Module</td>
<td>For Integration of conventional devices with addressable system.</td>
</tr>
<tr>
<td>5</td>
<td>Hooter</td>
<td>For notification of Fire condition through audible sound.</td>
</tr>
</tbody>
</table>

6.0 **OPERATION PHILOSOPHY:**

1. **INTELLIGENT ADDRESSABLE MICROPROCESSOR BASED FIRE ALARM CONTROL PANEL**

   The FACP is provided with sufficient number of loops along with 10 % spare loop to cover the areas as per the specifications.

   Addressable Panel is a modular system designed to meet the needs of standalone single node systems or multi-node networks. Virtually all Addressable system operating features are software controlled. This gives operating site flexibility and ensures operational changes up gradation will be needed years after the initial installation.

   ‘Loop’ describes connection of Detectors/Devices to the Fire alarm Control Panel.

   Intelligent Addressable Manual Call Points are directly connected in a loop, however in order to connect hooters in loop, control module is used.

   FACP is provided with sufficient battery backup in case of failure of power supply.

2. **INTELLIGENT ADDRESSABLE MICROPROCESSOR BASED MULTISENSOR CRITERIA DETECTORS**

   This device senses smoke first and then cross checks the existence of fire with temperature. If, both temperature and smoke are found with adequate value then this detector initiate alarm to the Addressable fire alarm and control panel.

3. **INTELLIGENT ADDRESSABLE MANUAL PULL STATION**

   This device is used when ‘Fire’ is detected manually, in order to convey Fire Signal to Addressable Fire Alarm and Control Panel.
4. **CONVENTIONAL HOOTER WITH INTELLIGENT ADDRESSABLE MICROPROCESSOR BASED CONTROL MODULE**

It is an Electronic Signaling Device, which is activated through Intelligent Addressable Microprocessor Based Signal/Control Module by Fire Alarm and Control Panel.

When “Fire” signal is detected by means of any of the initiating devices, then Hooter drives power supply (24 V DC) from FACP through control module or power supply module and creates audible sound. Hence any fault or fire condition is observed it can be heard through Hooter.

5. **INTELLIGENT ADDRESSABLE MICROPROCESSOR BASED CONTROL MODULE**

The control module is an Addressable device used to control external application like closers, fans, dampers or equipment shut down. The control module consist the relay which is in proper ON / OFF state. When Fire Alarm and Control Panel gives command to module the relay energies and changes its state accordingly.

Diagnostic LEDs are provided for visible indication at the status of the module.

6. **INTELLIGENT ADDRESSABLE MICROPROCESSOR BASED MONITOR MODULE**

The control module is an Addressable device used to have interface with external conventional devices i.e. flow switch, pressure switch etc.

Diagnostic LEDs are provided for visible indication at the status of the module.

7. **GRAPHICS SOFTWARE**

Graphics Software for the bidirectional visualization and remote control of fire alarm networks and the fire control panels.

User friendly graphics software along with P.C. and Printer will be provided for the record of the events.

Extensive help functions integrated. Import programming data of fire alarm and control panel via standard files is also possible.