Process Safety Quiz Part 1

1) Process Safety incidents can cause
   a) Multiple injuries and/or fatalities
   b) Massive asset damage
   c) Environmental consequence
   d) Reputation impact
   e) All of the above

2) Process Safety Incidents generally are a result of an unplanned or uncontrolled release of hazardous material.
   a) True
   b) False
   c) Sometimes, but not always
   d) True, unless it disperses to atmosphere

3) Permit to work
   a) Addresses personnel safety hazards only
   b) Addresses process safety hazards only
   c) Addresses components of both personnel safety and process safety hazards
   d) All of the above
   e) None of the above

4) Continuous improvement in tackling personnel safety issues automatically ensures that process safety issues are addressed
   a) Yes
   b) No
   c) Sometimes

5) Process Safety incidents are generally caused by failure of
   a) A single barrier
   b) Multiple barriers
   c) Sometimes single but sometimes multiple barriers
   d) None of the above

6) A safe plant is the one in which
   a) Integrity is established at the design stage
   b) Technical integrity is maintained throughout the life cycle of the asset
   c) Operating integrity is maintained all the time
   d) All of the above
7) At PDO the risk profile of our operations has
   a) *Increased over time*
   b) Remained the same
   c) Declined over time
   d) None of the above

8) Who is responsible for managing process safety and asset integrity
   a) Operations and Maintenance Staff
   b) Projects and Engineering Staff
   c) Contracts and Procurement Staff
   d) *All of us either directly or indirectly*

9) If you bypass an ESD function for preventive maintenance but have not properly defined mitigations you have
   a) *Removed a hardware barrier*
   b) Weakened the hardware barrier
   c) Removed a human barrier
   d) None of the above

10) If you see any leaks or spills what should you do
    a) Walk past as it is not your job to report it.
    b) **Report the leak immediately**
    c) Report only if the leak seems to be getting worse
    d) Report only if the leak is big
**FIND THE PROBLEM CONTEST PART -2**

Look at the pictures below and identify as many hazardous situation (problems) as you can

<table>
<thead>
<tr>
<th><strong>1</strong></th>
<th>Piping support is extremely poor. Wooden pallets are stacked for supporting pipe.</th>
</tr>
</thead>
<tbody>
<tr>
<td><img src="image1.png" alt="Image" /></td>
<td><img src="image2.png" alt="Image" /></td>
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<tr>
<td><strong>2</strong></td>
<td><img src="image3.png" alt="Image" /></td>
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<td><img src="image4.png" alt="Image" /></td>
<td><img src="image5.png" alt="Image" /></td>
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<td>4</td>
<td>Flexible Hoses are used to connect piping which do not fit together properly. Also the flange on the right appears to be missing at least one bolt and the faces of the flange do not align properly. The hose behind it would appear to be homemade by attaching a flexible hose to a pipe using a cable tie.</td>
</tr>
<tr>
<td>5</td>
<td>All the pumps are identical in appearance and there is no evidence of any labeling. Congested area and the pit is not covered.</td>
</tr>
<tr>
<td></td>
<td>Earth bond from a tank or vessel is being used to provide earth lead to temporary equipment. The earthing clip for temporary equipment has been put over the insulating tape thus defeating the purpose of earthing.</td>
</tr>
<tr>
<td></td>
<td>The cable gland has failed on this cable termination - this will result in loss of zone rating of the equipment and possible ignition source as the cables are exposed now.</td>
</tr>
</tbody>
</table>
Carbon steel valve has been fitted to a dissimilar metal pipe work. This will result in corrosion to the more noble material.

Valve is touching the ground and heavily corroded and will be inoperable due to lack of maintenance.

The flange assembly is not made correctly - there are bolts missing from the assembly, the bolts that are fitted are not tightened, gasket is missing and the flange face is are not parallel. These defects will result in failure of the joint assembly and loss of containment of the process medium. The slip flange fitted to the flexible hose assembly appears to be carbon steel - where as the mating flange appears to be stainless steel - this will lead to preferential corrosion and loss of joint integrity.

Earthing cable is cut, so no earthing is available and hence the electrical potential can build up resulting in sparks or stray currents.