

# Reinstatement of Plant & Equipment Inc. IT Equipment.

**White Paper 01**  
**— Restoration**  
**28.11.2017**

This white paper provides an insight into key processes to consider to ensure that many if not all of the plant and equipment can be returned to a pre-loss condition in the event of floods, fires and other forms of contamination.



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**Floods, fires and many other forms of contamination can cause irreversible damage to plant and equipment. However, in many cases taking the correct actions at the earliest time post incident can result in reinstating the equipment to a pre-loss condition.**

**This white paper will provide an insight into key processes to consider to ensure that many if not all of the plant and equipment can be returned to a pre-loss condition.**

# Common Types of Contamination.

## Water

In most cases water does not cause damage to equipment; it's what the water carries with it before entering critical sections of a plant or machinery that can cause short circuit or corrosion to occur leading to irreversible damage.

**There are 3 conditions of water contamination;**

- 01. Fully Submerged**
- 02. Partially Submerged**
- 03. Humidity**

The first two conditions are self-explanatory, however, humidity can cause almost similar damage comparable to the first two conditions.

If the plant and equipment is not directly in contact with water but water is present and stagnant, then humidity in that particular area may rise to a point beyond equipment design conditions leading to corrosion or even short-circuit when water vapour condenses on to live electrical circuit.

### Key Steps For Recovery

- 01.** Respond immediately.
- 02.** Power down all plant and equipment immediately.
- 03.** Involve the manufacturer early in the process.
- 04.** Remove water from the area and plant and equipment immediately and install dehumidifiers and heaters to maintain optimal relative humidity and temperature to inhibit any further degradation. Record relative humidity and temperature levels until reinstatement is complete.
- 05.** Arrange competent personnel to assess the equipment and when appropriate undertake visual assessment, technical decontamination and testing to verify condition of the equipment.

## Humidity can cause damage comparable to that of fully submerged or partially submerged water contamination

## Smoke

When a fire occurs plant and equipment where the fire occurs can be completely damaged beyond economical repair by the time the fire is extinguished. The extent of damage can be relative to every different situation.

Nevertheless, the bi-product of fire, that is smoke and soot can contain chemicals (mostly acidic in nature) within it depending on what is being burnt that can lead to corrosion and again short-circuit.

The corrosive action depending on the chemicals and the materials involved can be almost immediate and any part or component that is subjected to this can become beyond economical repair very quickly.

For example, a corroded worm gear of a CNC lathe machine will need replacement as any action to remove the rust will result in removing a layer of the material thereby changing the size of the screw threads that will affect the specifications of the product being produced.

### Key Steps For Recovery

01. Respond immediately.
02. Power down all plant and equipment immediately.
03. Involve the manufacturer early in the process.
04. Remove smoke/soot from the area and plant and equipment immediately and install dehumidifiers and heaters to maintain optimal relative humidity and temperature to inhibit any further degradation. Record relative humidity and temperature levels until reinstatement is complete.
05. Arrange competent personnel to assess the equipment and when appropriate undertake visual assessment, technical decontamination and testing to verify condition of the equipment.

Another step for recovery could involve spraying a suitable oil based solution to inhibit the corrosive effect of the contaminant.

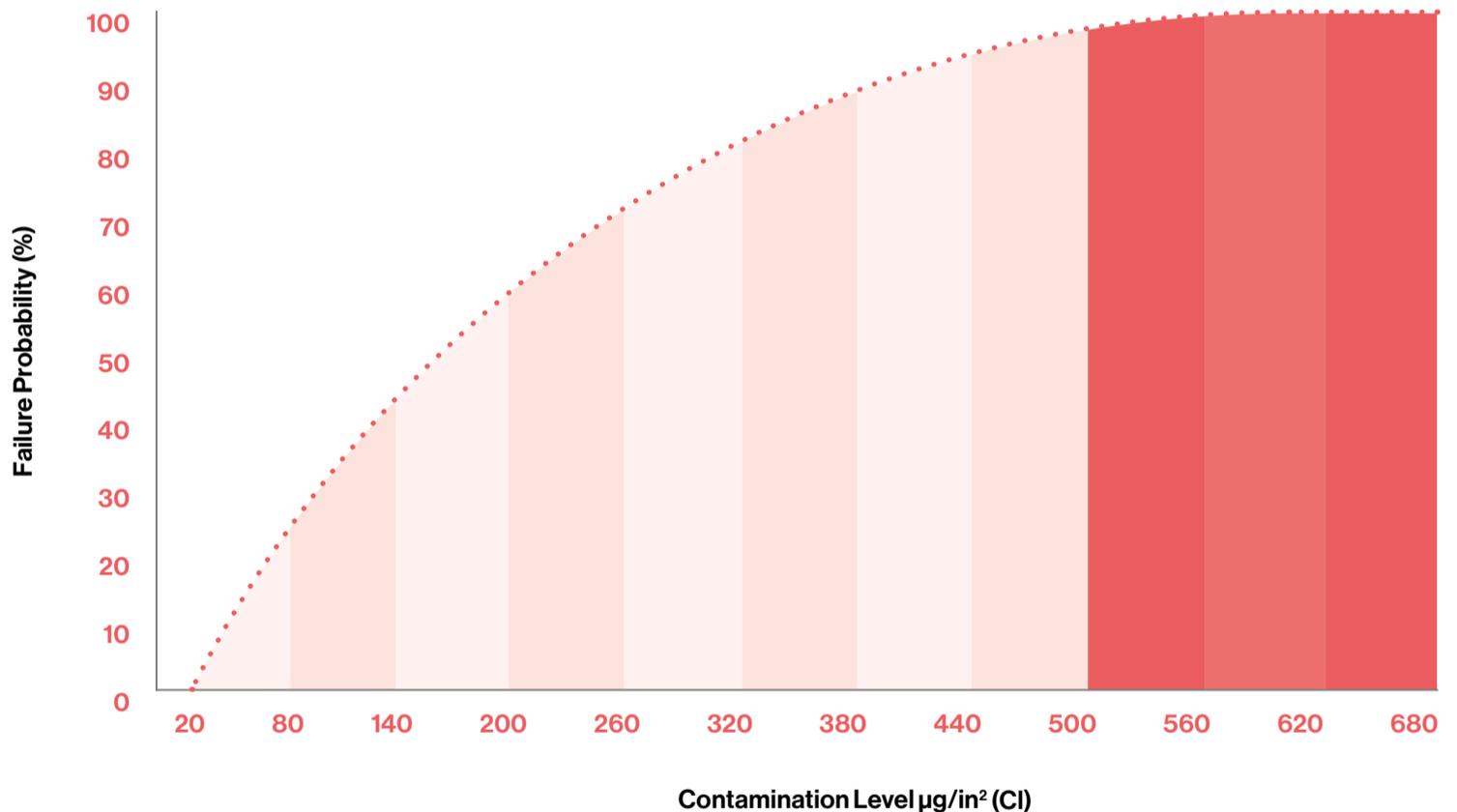
**Smoke and soot from a fire can contain chemicals that lead to corrosion and equipment short-circuit.**

## Latent defect

The key question during this process is regarding the latent defect post reinstatement. Prior to commissioning reinstatement, joint industry standard proven tests should be conducted to verify the probability of failure. The specific recognised tests to support the findings during inspection is IPC-TM-650; these tests are then analysed in an independent lab.

Test results are then plotted against the graph below and anything beyond 500µg/in<sup>2</sup> of equivalent

chloride ions is classified as beyond economical repair if critical sections costing more than 30% of the value of the item has been seen to be compromised identified by either corrosion or physical damage as a result of for example short circuit. Some equipment with over 1000µg/in<sup>2</sup> have been recovered as restoration companies were appointed immediately and remediation was conducted to remove the harmful chemicals.



## Conclusion

**In general, if the response is made immediately and necessary steps for recovery is set in place early in the process then majority if not all the equipment can be returned to a pre-loss condition.**

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