Dropsafe®

Drops Prevention Technology

# EMPOWERING DROPS PREVENTION

A DROPSAFE HANDBOOK

## CHAPTER FOUR

# TOOL TETHERING – THE FIRST LINE OF DEFENCE

## DEVELOPED IN PARTNERSHIP WITH STOPDROP TOOLING

Tool tethering is a crucial element of preventing dropped objects when working at height in the power generation sector. From thermal plants to nuclear power facilities, dropped tools pose a serious risk to personnel and equipment.

This section of the handbook bulids on the fundamentals addressed in chapter two will focus on how plant and HSE managers in the sector can prevent the risk of dropped tools by adopting a systematic approach to working with tools at height.

## THE RISKS POSED BY DROPPED TOOLS IN POWER GENERATION

Power plant maintenance routinely involves personnel working at height across multiple levels. During plant turnarounds and shutdowns, the number of personnel on-site increases – and so do the risks posed by dropped tools. Hand tools such as hammers, wrenches and screwdrivers, or their components, may slip from a technician's grasp and fall through gaps in railings leading to a Drops incident.

You can read more about the potential consequences of a Drops incident in chapter one of 'Empowering Drops Prevention: A Dropsafe Handbook'.

By taking a proactive approach to preventing dropped tools, plant and facility managers in power generation have an opportunity to effectively manage the risk of potential harm to their people, assets and businesses' reputation.




## A THREE-PRONGED APPROACH TO TACKLING DROPPED TOOLS

Following the principles of the 'Hierarchy of Controls', there are three key elements to ensuring safe, cost-effective mitigation of dropped tool risks in power generation. These are:

1. Tool design
2. Tethering
3. Training and application

### 1. Tool design

Implementing a Drops strategy aligned with best practice guidance requires tools on site that are specifically designed for working at height.

Where possible, plant managers should ensure the use of tools with the following characteristics:

- Engineered single piece design to remove failure points
- Designed with a specialised, integrated attachment point
- Colour coded and laser engraved to add traceability

#### Single-part tools

When tools are comprised of multiple components, years of wear and degradation can lead to failures. Plastic handles on hammers or files, for instance, may come loose from the heavier metal part, causing a Drops incident. Where possible, using tools that consist of a single part represents a safer option.

#### Purpose made attachment points

The DROPS 'Recommended Guidelines for the Safe Use of Tools & Equipment at Height' states that: 'tooling should be manufactured and supplied with tested and certified lanyard attachment points.'

The use of tape wrapped around tool handles to attach tethers is common in industries such as power generation, however.

The risk of applying adhesive tape to general tools is that it degrades over time, weakening its effectiveness and raising the risk of failure regardless of the number of times it is applied to the tool. This approach, where personnel adapt their general tools for working at height, also leaves increased room for human error.

#### Colour coding and laser engraving

Colour coding and engraving each tool with a unique identifier for each department means that a tool can be easily identified as part of a specific set. Should the tool be misplaced, or be involved in an incident, plant managers can trace the tool when carrying out a route cause analysis.

## DROPPED TOOL INCIDENT:
HEAD DETACHES FROM LUMP HAMMER

An incident highlighted by IMCA's 'Safety Flash' shows the importance of using the correct tools when working at height.

Two personnel were working with a spanner wrench and 2kg lump hammer at the upper level of a tower. The hammer was used to strike the spanner wrench, and upon impact, the hammer head detached from the handle and fell 25 metres.

There were no injuries as the area below had been barriered off, but according to the DROPS calculator, the hammer head would have likely caused a fatality if it struck a worker.

Crucially, the subsequent investigation found that:

- The hammer shaft was attached to a lanyard
- The hammer showed no defects when inspected prior to use
- The wooden shaft attaching the handle to the head failed

The incident would not be possible with a tool specifically designed for working at height, where the handle and head cannot be separated.

'Near miss' incidents such as this occur frequently in many industries, including power generation. Many go unreported, underlining the need for more consistent incident sharing between power generation facilities.

Pipelay tower showing where hammer fell

Broken lump hammer

### 2. Tethering

All tooling used at height should be attached via a lanyard to a tool bag, to a harness equipment loop or to the worksite. Lanyards can be constructed from plastic coil, fabric or stainless-steel wire, and should be fitted with double or triple action carabiners.

'Universal' lanyards may present challenges for power generation workers when working in a confined space or where an extended reach may be required to carry out a task. Choosing the correct lanyard in advance is crucial, saving unnecessary trips to swap out items, and thus reducing risk.

Heavier tools used in power generation should be secured to the worksite with wire lanyards. The DROPS Guidelines recommend that 'for tools and equipment ≥ 5kg, a minimum 4mm certified wire is recommended.' Best practice tethering solutions will ensure that coil lanyards can only be fitted to tools which are under this weight.

### 3. Training and application

Training personnel in the latest tool tethering best practice is crucial. There are no accredited tooling programmes in power generation, so plant and facility managers should ensure that robust training is available for their staff.

Applying tool tethering best practice effectively involves:

- Correct use of tool bags and belts
- Control measures
- Managing third-party contractors

#### Tool bags and belts

When working at height, best practice is to store tools within a bag, tucked securely inside and tethered separately to attachment points inside it. This ensures that tools cannot swing on their tethers when climbing or working at height, which could cause injury, damage to equipment or a Drops incident.

**The DROPS Recommended Guidelines stipulate that:**

- "Tools shall be taken aloft in some form of kit bag."
- "The kit bag shall be attached to the user, and leave both hands free."
- "Tools are to be attached to the kit bag (not merely put in it)."

**Control measures**

Using a static toolkit where tools need to be signed out manually from a central depot is an additional safety barrier enabling better housekeeping and tracking tool usage.

The Guidelines state: "Tools used at height should be logged in and out using a simple Tools Register to ensure that no tools have been left behind."

Furthermore: "Tools should be stored in such a manner that a simple visual inspection can highlight any discrepancies or omissions in the toolbox inventory, such as 2-colour laser cut foam inserts."

**Contractors**

Third-party contractors are an invaluable part of the turnaround process in power generation facilities, both bringing expertise and boosting capacity. Contractors will often supply their own tools, however, these may not be suitable for working at height.

Power generation facility managers should either supply safe tools for working at height, or ensure all contractors bring tools and accessories that are suitable – and safe – for working at height.

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Tool tethering is a crucial element of a holistic Drops prevention strategy for a power plant, but should tools be dropped, it is essential to have adequate secondary retention in place.

Stopdrop Tooling offers a full range of hand tools and tethering systems specifically designed to prevent drops while working at height. For more information, please visit: https://stopdroptooling.com/