The modern, fast and easy to use risk analysis tool

BowTie Pro™ Incidents

Getting Started Guide

Introduction

Covered in this guide

BowTie Pro™ provides a visual representation of the risk assessment process that can lead onto other elements

One element of a company's safety management system will be a process for 'Incident Investigation, Analysis and Reporting' whose purpose is to identify why things went wrong so that they can be corrected and future losses and business interruptions prevented.

Most Incident investigation techniques deal with the chain of Events and the Controls that failed. Many Incidents occur on previously defined assessments created using BowTie Pro™.

BowTie Pro™ displays the 'cause and effect tree' as the combination of the **WHAT**, **HOW** and the **WHY** models. In one diagram, a Threat should be stopped from releasing the Hazard/Event, by one or more Controls/Barriers.

If this does not happen and the Hazard is released then potentially all the Consequences will occur if one or more Controls on each of the Controls on the right hand side of the diagram does not stop each of the Consequences.

The steps in this process start with an initial fact finding exercise followed by detailed investigation, testing, analysing facts and assumptions, and formulating corrective actions to improve the management system and organisational culture that allowed the Incident to occur.

A series of faults and Failed Controls lead to the "Event", via a specific Incident trajectory. The Consequences could have been more severe but, the Incident progression was stopped by an Effective Control. Incidents happen when people make errors and fail to keep the Controls functional or in place e.g. people doing the wrong thing or people not doing what they should do.
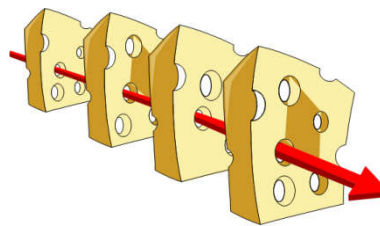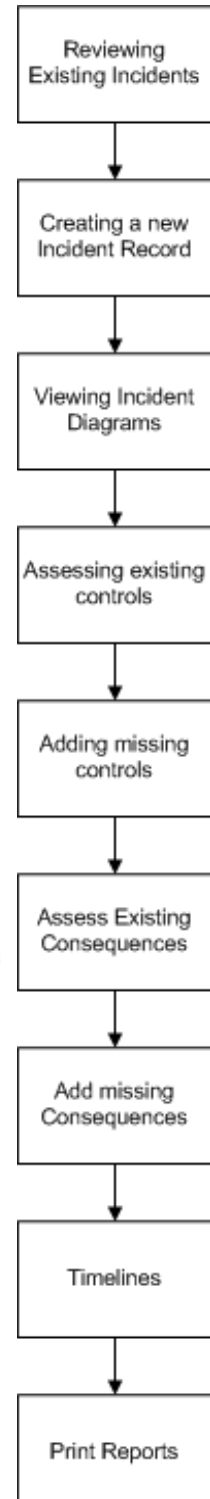
BowTie Pro™ Incidents utilises the Tripod Theory to allow the user to conduct Incident analysis either after or during the investigation itself. This enables investigators and analysts to systematically and comprehensively:
- ✓ Direct and refine their fact finding;
- ✓ Confirm the relevance of their fact gathering;
- ✓ Highlight avenues of investigation pointing to the identification of underlying causes.
- ✓ Identify and resolve any logical anomalies whilst the investigation is still active and
- ✓ Produce a definitive report

Reviewing the appropriate bowtie risk assessment associated with an Incident helps identify Controls in the Incident diagram and once the Incident is analysed this can be fed back into the bowtie diagram.
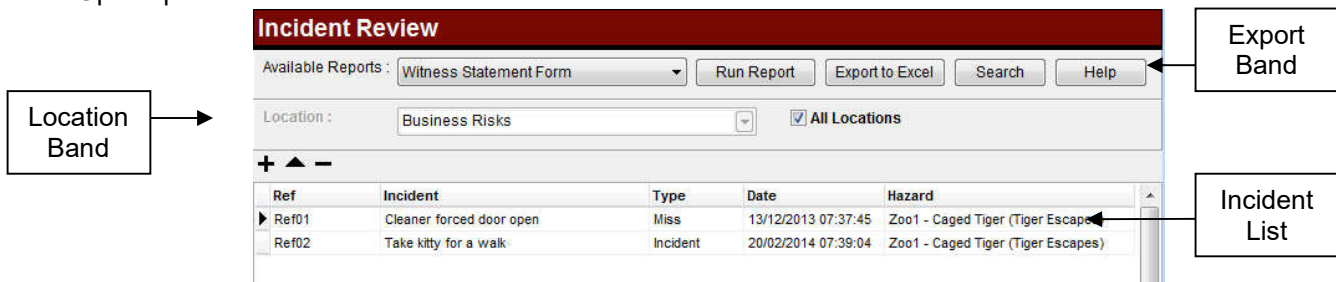
These methodologies enable a systematic and comprehensive process to be carried out and reviewing the appropriate bowtie risk assessment, associated with an Incident, will help identify Controls in the Incident investigation.

Reviewing Existing Incidents

Creating a new Incident Record

Viewing Incident Diagrams

Assessing existing controls

Adding missing controls

Assess Existing Consequences

Add missing Consequences

Timelines

Print Reports

Step 1 – Reviewing Existing Incidents

Open up the Incident Review Screen

From this screen it is possible to manage the Incidents. Running a report and exporting to Excel is described later in this document. It is possible to filter the Incidents for a specific location or show all Incidents by clicking the "All locations" box in the locations band.

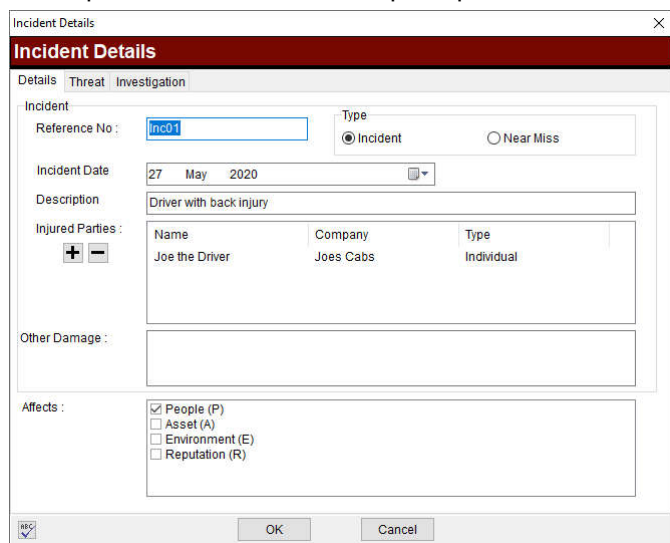Items can be added ✚, edited ▲, or deleted ➖ using the toolbar buttons.

There is also the option to show timelines and other analysis modules.

Step 2 – Creating a new Incident Record

1. Either Press the ✚ button or select "New Incident" from the popup menu.
2. Select the Hazard where this Incident occurred and press "Select". This will open up the "Incident details" screen

On the "Details" tab, provide
- A reference number
- Select if it was an "Incident" or "near miss"
- The date when the Incident occurred
- Short Description of the Incident

- Optionally the Injured parties can be added using the ✚ button
- Other damage and which aspects of the matrix this Incident affects can be added if appropriate
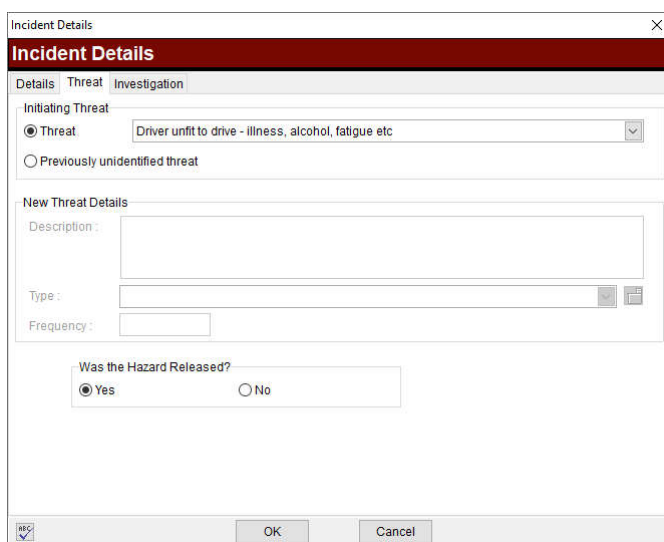

"Threats" tab
- Select if it is a previously defined Threat or a new Threat
- Select the Threat that released the Incident or enter a description of the Threat if it is a new one
- Select if the Hazard that was released or if a Threat Control prevented the Hazard from being released

The "Investigations" tab provides details on the team that is investigating the Threat. This is optional at this stage

Once we have completed these details press the "OK" button and you will be taken back to the Review screen.

Step3 – Viewing Incident Diagrams

Double click on the new Incident or right click and select "Open Diagram". From the diagram it is possible to edit the Incident analysis
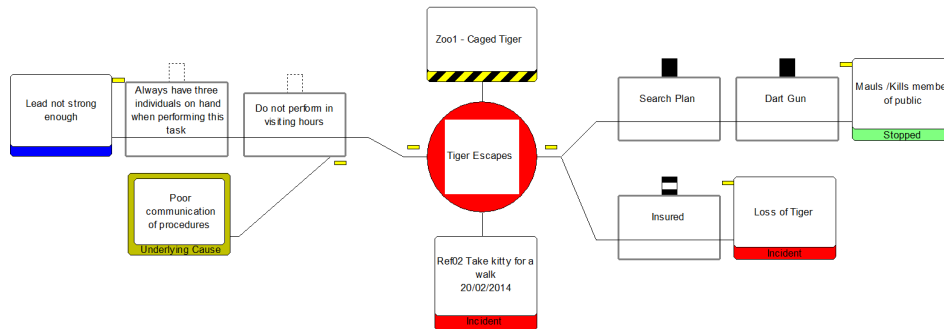
Just as in the bowtie diagram the Threat is on the left hand side, but in an Incident diagram there is only the Threat that was released listed. If the Hazard was released on the right hand side there are both the Consequences defined in the bowties but can also have Consequences that were previously unseen.

If Consequences are shown these are colour coded depending on their effect

For a Consequence there are four result options:

- **Not Affected** - This is the Consequence previously defined as not being an issue on this Incident
- **Consequence not reached** – The Consequence is appropriate on this Incident but a barrier stopped it from being reached
- **Consequence reached but a near miss** – This is when a barrier did not stop this issue but the listed Consequence eg explosion did not occur by chance
- **Consequence occurred** – The barrier did not stop the Event and the feared Consequence was experienced.

Between the Threats and Consequences should be Controls. In the case of existing Threats and Consequences, the Incident diagram will display all the Controls defined when building the bowtie. If there are Controls identified that were not defined in the bowtie these can also be added to the Incident diagram. The top of the Control denotes the effectiveness of the Control. These are as follows:


Failed
A Failed Barrier node is shown as letting the Hazard/Event or Threat to pass through a 'gap' in the Barrier.

Inadequate
A Inadequate Barrier that it was in place but was inadequate for the intended role.

Effective
An Effective Barrier node represents a Barrier that did not fail and provided the successful containment of a Hazard/Event. It is used to model a 'Near Miss' or a branch of an Incident diagram where further injury, damage or loss was averted. There is no Immediate Cause,

PreCondition or Underlying Cause nodes linked to it.
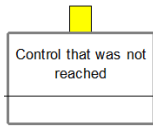
Control not reached

This is a barrier that was in place but was not tested because another Control was effective
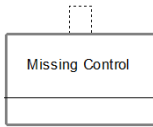
Missing from the bowtie

A Missing Barrier node provides for cases where plans and procedures have specified a Barrier but investigation shows that none was established. There are no Immediate Causes for this type of Barrier and it is linked directly to an Underlying Cause.

Initially all Controls will be defined as failed. Double click on each Control in turn to edit the items.

Step4 – Assessing existing Controls

The Description of the Control comes through from the bowtie and is read-only on this screen

On the Controls "Details" tab select the effectiveness of the Control in the "type" box. Existing Controls can be:

- Failed
- Inadequate
- Effective
- Not Reached

If the type is "Inadequate" or "Failed", enter the date that the Control failed and a description of the failure if known
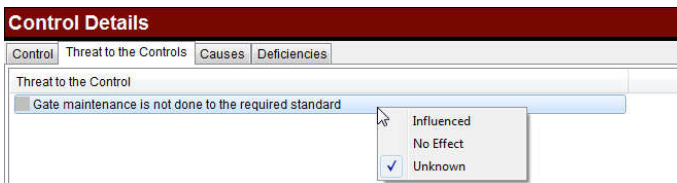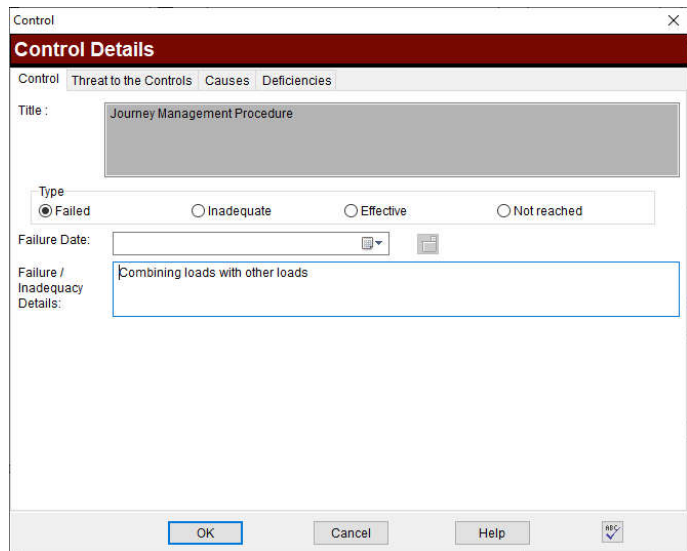
On the second tab the contributing "Threats to the Controls" or "Escalation Factors" can be evaluated

On the third screen the Cause can be defined if the Control is "Inadequate" or "Failed".
- The Immediate cause is in the top of the box and is what was done to make the Control fail
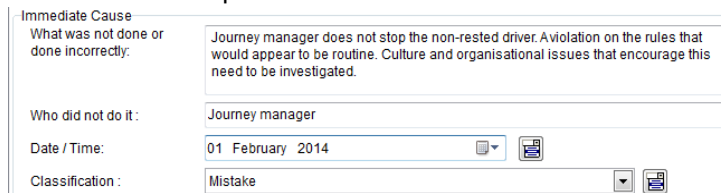
- There can be many "PreConditions" for the immediate cause and these are defined in the bottom half of the screen. Right click on the box and select "Add PreCondition" from the popup menu. If other PreConditions have been entered for this Incident then these can also be attached to the Control.
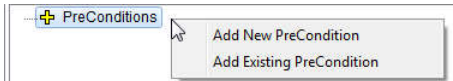
- Each PreCondition can have many "Underlying Causes"

The final screen allows "Deficiencies" or Actions to be entered exactly as can be added to Controls when building Hazards.

Step5 – Adding missing Controls

To add a Control that should have been in place but was not defined in the Hazard build, right click on the Threat and select "Add missing Control"

The description of the new Control is mandatory.

The Failure details can be entered if there are details to enter but this is optional

The missing Control can only have Underlying causes not PreConditions of Immediate Causes.
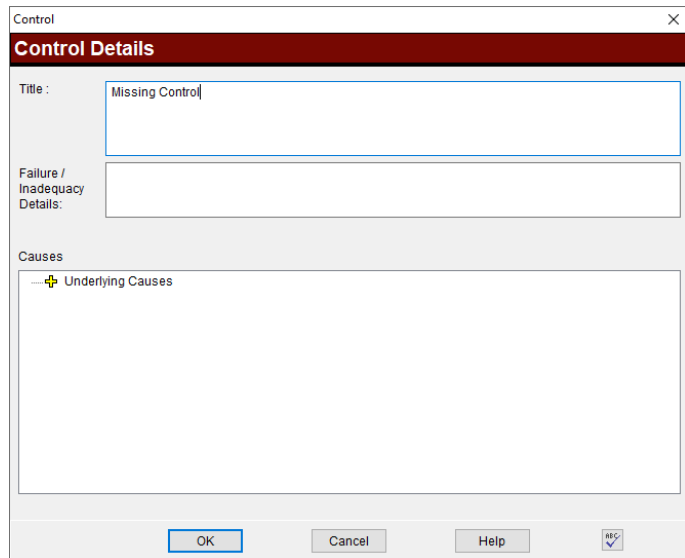

Step6 – Assess Existing Consequences

The Consequences that were previously defined in the bowties will be listed on the right hand side if the Hazard is marked as being released.

To open up the Consequence double click on the item in the diagram.

- The description will be read-only
- The Type is the effect
- The description of the actual details can also be entered if appropriate
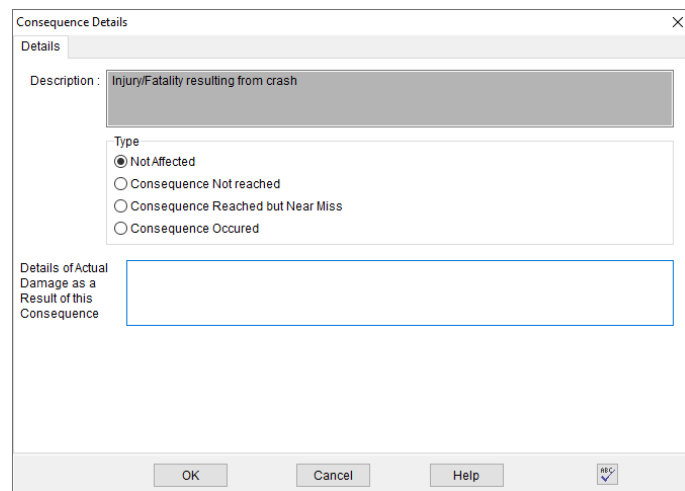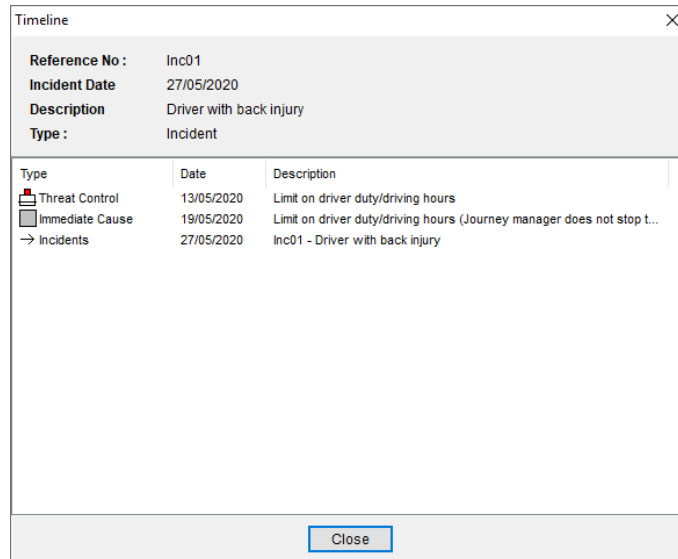

Step7 – Add missing Consequences

If there are Consequences that were not envisaged in the bowtie build these can be added by right clicking on the Hazard ball and selecting "Add Missing Consequence". This will open up a screen identical to the existing Consequence but the description is editable and mandatory.
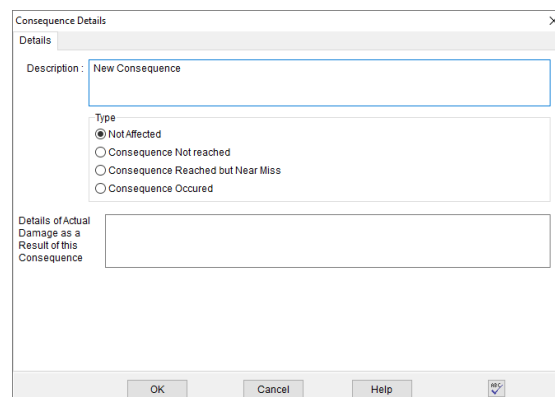
Step 8 – Timelines

The timeline lists all the dates in a particular Incident. This can be a good tool to identify why an Incident occurred. All the dates are listed in order regardless of the type. The dates are defined on the:

- **Immediate Causes** – The date of the immediate cause that the will lead to the Control failure
- **Controls** – Failure dates
- **Incident** – When the Incident occurred.
- **Incident** – Submission of the report dates.

To open up the screen right click on the Hazard ball in the diagram and select the "Show Timeline" option or from the review screen right click in the grid and select "Show Timeline"

Step 9 –Print Reports

As has been the case in BowTie Pro™ there is the ability to print both diagrams and reports specific to a specific Incident but also Incidents for Hazard or all Incidents for a case.

Printing/Saving a diagram:

BowTie Pro™ Incident diagrams can be printed or generated in a range of picture formats including JPG, BMP, GIFF, TIFF, PNG etc as well as being able to be copied to the Windows Clipboard.

Open up the diagram you wish to print/export and expand the diagram to display the information required on the resulting printout or image.
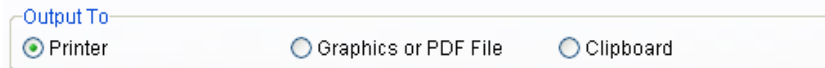
Press the print button 🖨 and the print screen will be displayed. On the general tab select the desired destination of the output. This will change the rest of the screen.

- If graphic file is selected add the "file name" in the "Graphic file".
- If printer, change the printer select the printer required by pressing the "Properties" button and in the "scaling" section select "Fit to" one page so that it does not straddle multiple pages.

Now select OK at the bottom and the output will go to the desired location. If it is a graphics file BowTie Pro™ will ask if you want to see the picture once it is printed.

Incident Reports:

A report can be run for a specific Incident from either the Review screen or the diagram.

On the Review screen:
- selecting the Incident on the grid
- Select the required report from the "Available Reports" dropdown
- Press the "Run Reports" button

To display a Incident report from the diagram, hover over the Hazard ball and right click with the mouse.

Select the "Incident Reports" menu option from the list of items. This will now show all available reports for an Incident.

Select the one you want to display and it will open the report on the right hand side.