

# [News story: BowTie: a visual tool to keep an overview of risk management practices](#)

BowTie finds its roots in the chemical industry course notes for a lecture on hazard analysis given at the University of Queensland in 1979. The exact origin is unclear but the mainstream use started in the aftermath of the Piper Alpha disaster with Royal Dutch/Shell adopting the methodology as the company standard for analysing and managing risk. It is widely regarded as a suitable visual tool to keep an overview of risk management practices, rather than replacing existing processes or systems.

[RA 1205](#) provides a regulatory framework for an Air System Safety Case (ASSC) for each platform and identifies that it is not a single document, but a living body of evidence. Thus, ASSC based auditing techniques can be both complex and time consuming. BowTie can be employed to simplify this and improve the communication of risk by acting as an overarching document that collates all the documentary evidence of an ASSC together, meaning that it can then be interrogated to source auditable data that underpins the Safety Statement. With the publication of [RA 1210 Issue 4](#), Operating Duty Holders (ODH's) have been given more latitude in the way in which they choose to record and document risk within their area of responsibility allowing the scope to incorporate and develop good practice. For several years, the majority of ODH's have been developing risk management systems that embrace the BowTie risk assessment methodology as it is believed that, when used correctly, it can provide an easier to interpret and more holistic view of overall risk exposure.

Of the 6 ODH's that cover UK military flying, 5 have made a commitment to using BowTie within their respective Air Safety Management System (with the 6th now developing a capability). Early adopters have been working on its implementation for several years and are continuing to make significant developments in the way BowTie is utilised and how the software is implemented. There has been a significant investment in the translation of current risks from the traditional risk register into the BowTie format, and training key personnel in a revised way of working. The MAA has intentionally remained at arm's length, in order to encourage the development of good practice by the user community, whilst keeping a Regulator's oversight to ensure that the work implemented remained within the bounds of RA 1210.

Up until 2017 all ODH's maintained suitable Platform Risk Register's to meet the intent of the MAA Regulatory Publications, but in early 2017 Air Officer Commanding (AOC) 2 Gp made the decision to move completely from risk registers to using BowTie as the sole method of recording and presenting risks and risk management. The decision was made once the Gp's SMEs were content that the BowTies were sufficiently developed to ensure no degradation in the risk picture presented.

AuditXP. Crown Copyright. Photo: via MOD.

The BowTie user group has made progress in agreeing a common approach to BowTie creation and produced a pan ODH level BowTie Standard Operating Procedures complete with a description of what a BowTie consists of and the taxonomy that is to be used. This has aided with configuration control and allows for easier analysis across all areas as the picture will look the same. This document continues to evolve as more functionality is included within the BowTies. The choice was made to use the standard taxonomy for BowTie to allow for shared learning from industry and to reduce training cost for personnel involved in the development. Therefore, risk terminology was changed to fit with the barrier (vice mitigation) based risk management model. Rather than dealing with the traditional risk based approach each BowTie deals with a hazardous situation and loss of control and can cover multiple risks.

These elements can then be embellished with additional information to allow for easy viewing of barrier effectiveness, owner, manager and importantly the evidence that underpins that assessment. The inclusion of Air Safety Information Management System data will allow for interrogation of the BowTies to further refine the effectiveness assessment of barriers and will generate a huge amount of quantitative data for analysis by Front Line Command and the MAA alike. There is no automatic process that updates the effectiveness rating and human interpretation is required before a change is made. Additionally, a currently unused but being explored capability is the generation of questionnaires allowing for targeting questioning of personnel to understand how a barrier is functioning.

IncidentXP data close up. Crown Copyright. Photo: via MOD.

BowTies are never truly complete as they are subject to continual review and as such are a living document. As the existing documents are further developed more of the existing functionality with the software will be utilised and additional tools will be delivered to increase the synergy between occurrence reporting and the risk management process. As to where we go next, there is significant interest from the Defence Equipment and Support (DE&S) community to communicate hazards in the correct language for the ODH risk assessment model, without the need for translation. The DE&S Airworthiness Team via the ASPIRE project, is investigating the viability of transitioning DE&S to BowTie methodology. All ODH's have been consulted and have agreed that the project is a step towards fully integrating the risk management process.

There is still more work to be done to ensure that the taxonomy used is acceptable by both the equipment and operating stakeholders. Along with this, many of the user groups are starting to use BowTie for functional safety with a clear interest in its ease of interpretation.

This year will see the reinvigoration of the legacy BowTie User Group (BUG). Previously this was a large meeting with representation from a wide cross section of stakeholders attending, each having particular issues to raise. To improve upon the quality of the information exchanged, the BUG will be

rebranded the BowTie User Forum and will have comprise of a periodic symposium that will include topical discussion and Q&A sessions and the creation of a dedicated BowTie SharePoint portal with a discussion board and wiki pages. It is within the dedicated BowTie SharePoint portal that the most current and up to date information regarding BowTie and its development will be found. Training availability will be advertised with links to application forms in addition to how to get a software or BowTieServer licence. Introductory training is provided currently through the MAA Air Safety Risk Analysis & Management Practitioners (MASRAMP) course held at Centre of Air Safety Training (CoAST) and there is a desire to include a bespoke BowTie training course for more advanced users as part of the Safety Training for Error Prevention (STEP) contract.