Life is filled with uncertainties and the unexpected always happens … But help is at hand in the form of software applications that can help you manage when things go pear-shaped. We investigate how risk-management software has developed to the point where it is even used to dodge space junk.

According to Michelle Von Lind – executive assistant at mySolutions, a South African based e-solutions provider – software has influenced companies dramatically over the past few years. “More and more companies are realising that introducing a health and safety management software solution into the business simplifies ways of working and covers aspects that might otherwise be overlooked. Most importantly, it helps to keep better track of any areas where the company might be lacking – thus helping it to correct these aspects strategically and affectively.”

She adds that FastWorks , a full safety, health, environmental, risk and quality (SHERQ) system from mySolutions, adapts according to a company’s International Organisation for Standardisation (known as ISO) certification.

FastWorks streamlines compliance with ISO 9001 (which sets out the requirements of a quality management system), ISO 14001 (which sets out the criteria for an environmental management system) and OHSAS 18001 (an international standard for occupational health and safety management systems).

“FastWorks is a very user-friendly system that can easily be customised to suit any company’s needs,” says Von Lind.

Claire Saunders, client liaison manager at mySolutions, adds that FastWorks is a web-accessible system with real-time data that links from all a company’s sites and divisions. “It integrates to any e-mail platform for alert triggers and notifications.”

The company also launched FastAudits – a web application that is used to complete and manage audits – at this year’s Occupational Safety and Health (OSH) Expo Africa, which ran

during May at the Gallagher Convention Centre in Midrand. Von Lind adds that this solution is available on a rental or purchase option.

Saunders continues: “FastAudits enables companies to create checklist templates for easy creation of audits – as and when they are required. Users will receive notifications of when the audits are due and escalations can be configured for missed deadlines.” She adds that users can complete the audits and inspections from any mobile device with the option of an off-line ability.

It appears that software doesn’t only do the “groundwork” when it comes to risk management – it keeps some “overheads” in check as well … in more ways than one. This is evident when it comes to space junk (the collection of defunct objects in orbit around Earth), setting an obstacle course for many satellites that are of paramount importance to humanity.

Why satellites? Well, as the Union of Concerned Scientists – a non-profit science advocacy organisation based in the United States (US) – points out, satellites provide meteorologists with the ability to see weather on a global scale.

This allows them to follow the effects of phenomena like volcanic eruptions and burning gas and oil fields, as well as the development of large weather systems like hurricanes and El Niño. It would, therefore, be difficult to predict natural disasters without these spacecrafts; making the

wrath of nature even more dangerous.

However, thanks to the National Centre for Atmospheric Research (NCAR) – a US federal organisation managed by the University Corporation for Atmospheric Research (UCAR)* – and others, satellites can avoid the space junk minefield, as the conglomerate has designed a simulation program that predicts a route through the debris obstacle course.

Bob Henson – writer, editor and media relations associate at AtmosNews** – in his piece: Helping satellites dodge space junk, explains that NCAR was commissioned by the US Air Force to develop the Atmospheric Density Assimilation Model (ADAM) – which is now in its testing mode.

“Right now the Air Force tracks roughly 19 000 pieces of space debris, but nothing can be done to change any of their paths. Instead, satellite operators have to adjust spacecraft orbits to steer around the debris,” writes Henson.

He adds that, until recently, the Air Force has relied on climatologically based models, which can’t account for erratic solar storms, to estimate near-term shifts in atmospheric density, “much as someone might use average highs and lows in a given city to make a rough guess about tomorrow’s weather”.

Henson points out that accurate information about the atmospheric density is very important to correctly project orbital adjustments of satellites. “Scientists need to know how the density of the atmosphere is evolving in the low-Earth orbit (LEO) zone, several hundred miles above the surface,” he notes.

“Both everyday heating by the Sun and occasional solar storms cause the upper atmosphere to expand,” adds Henson. “This exerts added drag on LEO satellites, pulling their orbits closer to Earth.”

He points out that ADAM will predict satellite paths up to 72 hours in advance by using real-time information on satellite tracks and space weather. Henson adds that the simulation tool will

draw on three upper-atmosphere models; two from NCAR and one from the National Oceanic and Atmospheric Administration's (NOAA's) Space Weather Prediction Centre.

"NCAR will provide ADAM with data on current solar activity as observed by NASA's Solar Dynamics Observatory and NOAA's Geostationary Operational Environmental Satellite network," writes Henson.

"A graphical interface will allow users to select input for ADAM, interact with the component models as they run, and monitor the output. Similar to NOAA hurricane guidance, ADAM will help users produce a cone of possible future trajectories of space debris, together with projected satellite tracks."

He adds that the initial ADAM model is now complete. The next phase will include a round of testing that began in June and will continue until next year. "Once finalised, the system could eventually be used in both military and commercial settings."

Back on planet Earth, Von Lind says that more and more businesses are purchasing integrated risk management software solutions to help them streamline all tasks within their safety departments. He notes: "Companies are recognising the need to invest in these solutions, as they can save time and money as well as help reduce the possibility of receiving fines for small items that could possibly be overlooked."

Saunders adds: "As we move to a more mobile era, the goal of many organisations is to eventually move towards a paperless environment where mobile devices will be used to document all SHERQ-related information, complete audits, log incidents and investigate matters."

*UCAR is a non-profit consortium of more than 100 universities and colleges offering degrees in atmospheric and related sciences.

**AtmosNews highlights news, views and analysis from NCAR, UCAR and its partners in the research and education community. Check out its web page for more insightful environmental

bulletins.