

March 16, 2006

# Removing the risks of human error

Automatic Guided Vehicles make a *(healthy)* impact on workplace safety and efficiency

- Thousands of forklift-related injuries & deaths
- Hundreds of thousands of lost production hours
- Hundreds of Millions of dollars in compensation claims
- PLUS: Damage to product, equipment, infrastructure

### What can you do about it?

**Automatic Guided Vehicles (AGV's)** are mobile, robotic material handling vehicles that do tasks similar to forklift trucks. The big difference is that the AGV operates without a driver or any human intervention. Often travelling several kilometres each day with no coffee or lunch breaks, they operate 24-7 only stopping to pick up a fully charged battery.

**Robotic Automation P/L's (RA's)** exclusive "RA-GV" vehicle manufacturers give "birth" to over 200 of these machines each year, and are available in Australia and New Zealand in RA's solutions.

Though in primitive use and development since 1950, AGV's gained wider acceptance overseas in the 1980's via printers of newspapers who were looking for a better way to deliver rolls of paper to the printing presses. Now the customer base is diverse with many manufacturing industries seeing the benefits of automating material movement. Potential users of AGV's can be found in automotive, printing, healthcare, paper, plastics, food, beverage, pharmaceutical, manufacturing & warehousing industries. AGV customers include many of the leaders in their respective industries including Daimler-Chrysler, Ford, General Motors, Honda, Volvo, Kraft, ConAgra, Exxon Mobil, General Electric, Procter & Gamble, Merck, Pfizer, Panasonic, Caterpillar, Whirlpool, Dupont, Kodak, & many more.

The Australian story of AGV's began in much the same way, with newspaper printers being among the first to take advantage of the technology. **News Ltd** printing plants (producing *Herald Sun*, *Daily Telegraph*, *Advertiser* etc) in Perth, Sydney, Adelaide, Brisbane and Melbourne - all boast AGV fleets from one of RA's manufacturers.

All these customers expect the AGV system to improve manufacturing operations by making sure that the right materials are delivered to the right place at the right time – "just-in-time, every time". Some typical applications include raw material delivery, moving work in process, and removal of finished goods. In each case, the movement of materials is considered a "mission critical" activity by the customer, because any interruption in this last leg of the supply chain will quickly limit or stop production.

### MATERIALS HANDLING

## Forklift takes another life

**A** MAN died November 8th last year after being crushed by an overturning forklift that he was operating at Irymple in north-west Victoria.

WorkSafe is investigating the incident which happened at the premises of SDS Food, Beverages and Wine in 15th Street.

Without commenting on the investigation which is at an early stage, the Director of WorkSafe's Manufacturing Logistics and Agriculture Program, Trevor Martin, said forklifts were among the most common and potentially dangerous, pieces of equipment in Victorian workplaces.

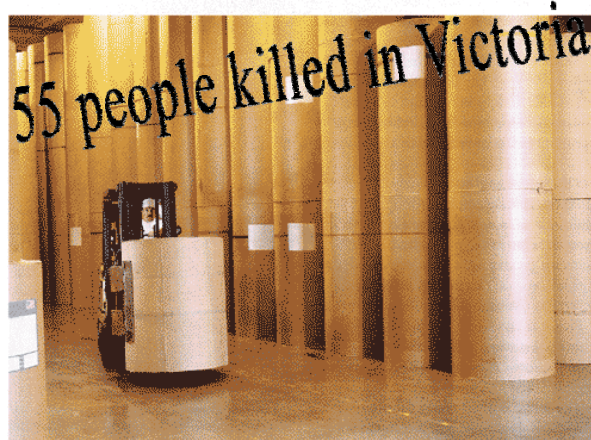
"They are not forgiving if something goes wrong. Forklift owners and operators should take whatever steps are necessary to protect their workers and themselves," Martin said.

Of 55 people killed in Victorian forklift-related incidents since 1985, 10 were operators who were crushed when they either jumped or fell from the machine.

Tip-overs are the second-highest cause of forklift-related deaths. They are also responsible for a high number of serious workplace injuries.

Seven people have died as a result of incidents involving forklifts since the start of 2003.

"Forklifts collide, lose loads and they tip. It may only take a bump, a turn taken too fast, or if there is an unscanned beam,



55 people have died in Victoria as a result of incidents involving forklifts since 1985.

pole or pedestrian.

"The factors or combination of factors, that cause these incidents are well-known," Martin said.

WorkSafe is currently running a statewide zero-tolerance campaign targeting incorrect use of Victoria's 85,000 forklifts.

The machines were also a focus of WorkSafe's Safe Work Zones campaign which began in November in

Thomastown, East Keilor, Noble Park and West Footscray.

Teams of inspectors visited industrial estates as part of the program which ran till December.

WorkSafe has released a range of guidance material about forklift safety including "Forklift Safety: Reducing the risk - Forklift instability".

For more information call 03 9641 1333 or visit [www.worksafe.vic.gov.au](http://www.worksafe.vic.gov.au).

According to the state government body, **Worksafe Victoria**, **6000** forklift-related injuries were recorded in 1985-2003 in Victoria alone, resulting in excess of **\$130 million** in claim payments and incalculable losses of production time.

**Continued →**

**RA's "RA-GV" manufacturers have not had even a single reported case of AGV-related injury.** This is despite their use in over 100 countries around the world and often in environments of high pedestrian-traffic, such as hospital corridors, where AGV's are also used to transport materials and waste.

A considerable amount of technology has been invested to secure this reputation. The technology includes a unique blend of mechanical hardware, electrical controls and software.

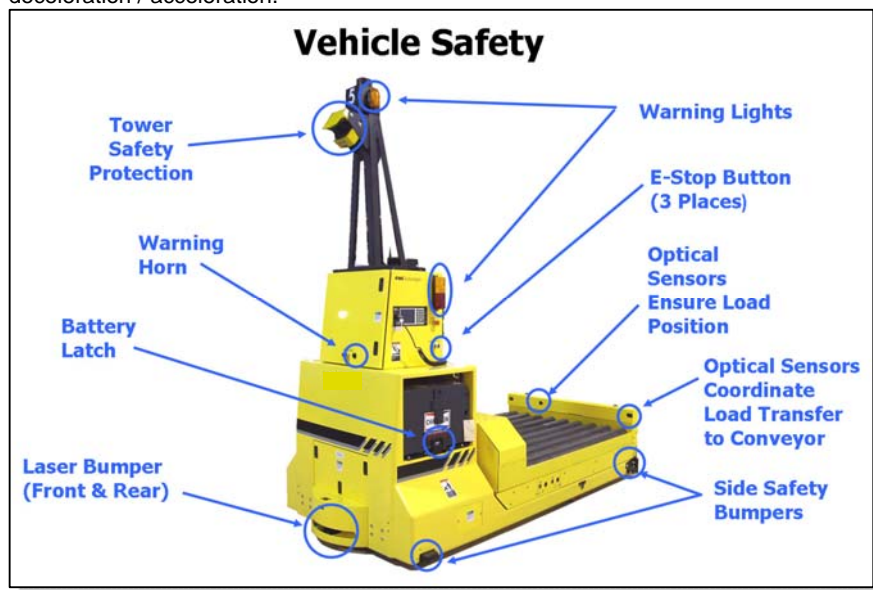
Each vehicle has a personal computer on-board, complete with processor, memory, and even LCD display. A "roadmap" of the facility showing all pre-programmed travel routes is stored in memory. The vehicles stay on the path by continually comparing where they "think" they are with where they actually are. The actual position is determined via triangulation with data obtained from a rotating laser mounted on the vehicle and reflectors that are mounted on walls and adjacent machinery. The vehicle corrects for any deviation in positioning at a rate of 40 times per second so the vehicle is always on the right path.

To make sure the vehicles operate safely around people and other mobile equipment, an obstacle detection system completely surrounds the vehicle. Should the vehicle approach an obstacle in the guide path, sensors will detect the obstacle allowing the vehicle to come to a safe stop before contacting it, thanks to smooth, software-controlled deceleration / acceleration.

before lifting the reel. Too much pressure causes distortion, and a reel that is even slightly misshapen or "egged" will not wind off smoothly through the press, sometimes resulting in the waste of an entire reel of paper or necessitating a time-consuming re-winding of the paper to a new reel.



The equivalent clamp-model AGV uses precise positioning and pressure sensors to deliver just the right amount of force to ensure a safe grip.



Of course, Forklift accidents don't just harm staff, they can also damage product, raw material, and infrastructure. Just taking the paper-reel handling example illustrated (previous page), the forklift driver manually sets a reel-clamping device

An AGV system can have one or many (50+) vehicles. It is typical to have a supervisory computer act as a "traffic cop" telling vehicles where and when to go to ensure the most efficient operation of the entire system. Vehicles communicate with the supervisory computer over a wireless network, checking in **once every second** to make sure they are working on the most important task. The supervisory computer also communicates with other equipment (automatic doors, etc.) and software, sharing data to support the changing demands of production.

Contact **Robotic Automation P/L** for further information.

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