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**STATE**

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**CORONER**

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**VICTORIA**

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**RECORD OF INVESTIGATION INTO THE DEATH OF FRIEDRICH  
HINTERHOLZL**

*Held at the Coronial Services Centre, Southbank  
on 3<sup>rd</sup> February 2000.*

Case no: 2632/98

**Findings**

The death of Friedrich Hinterholz occurred on the 2<sup>nd</sup> September 1998 at 3 Lake Drive, Dingley from head injuries.

1. Mr. Hinterholz, aged 61, was employed as a forklift driver by DSG Pty. Ltd (trading as Australian Pacific Paper Products) at the time of his death. He held a licence to drive a forklift and had worked with the company for 8 years.

At about 2.30pm on 2<sup>nd</sup> September Mr. Hinterholz was operating a Crown 35 SC TT 240 forklift at Australian Pacific Paper Products when the forklift tipped over pinning and crushing his head under the rollover protection bars. Apparently, he either attempted to jump clear of the toppling vehicle or has fallen with it.

Mr. Hinterholz was not wearing a seatbelt or a safety helmet.

2. On 2<sup>nd</sup> September Mr. Peter Woodfine, leading hand was working in the warehouse. He had some discussion with Hinterholzl at about 2.10pm:

*'Fred came to me to complain that the delivery he had just unloaded from 3M was mixed pallets again, that is that there was more than 1 item per pallet which made it difficult to check against invoice and also when we put them away we can allocate only one product per location. I asked Fred what he wanted me to do, he said nothing that he had fixed it, but he wanted me to be aware of it, and that he would then put the stock away.'*

Mr. Hinterholzl was annoyed at the difficulties the supplier had caused with the loading operation. At about 2.30pm Woodfine heard a loud crash and on inspection discovered the forklift on its left-hand side with Hinterholzl partially under the rollover cage. Woodfine observed that:

*'the mast on the fork was extended to fair height, the tynes were empty and there was nothing that had been dropped.'*

Mr. Woodfine considered that Hinterholzl probably had just put a pallet of goods away in the racks and after filling in the paperwork and, in error, had proceeded to operate the forklift with the mast extended.

The fact that the mast of the forklift was extended almost to its limits and the operator in the process of turning the vehicle contributed to it overbalancing and tipping. There may have been an element of speed also involved as a factor in the incident.

According to Mr. Patrick Gaffney, a field service supervisor with Crown Equipment Pty. Ltd., a limit switch automatically operated to reduce travel speed to around 70% of top speed when the mast is in the raised position. Speed is also reduced in a turn (by cutting out one motor) when the mast is raised. The top speed of the unit is 10 kph. The *'Technical Information'* in Crown's operator's manual explains that the speed limit switch *'automatically reduces maximum travel speed immediately upon extension of second and third stages.'* The process is called *'staging'*.

3. Mr. Robert Amer, Company Secretary and Manager indicated:

*'Regular meetings are held with forklift drivers where issues of driver safety are dealt with. Each forklift driver is under the direct supervision of the warehouse supervisor Francois Rouge and the leading hand Neil Woodfine...all our forklifts are regularly serviced, that is monthly by the manufacturers of the forklift Crown equipment.'*

Mr. Amer stated that in addition to documented safety procedures, training and disciplinary processes:

*'Forklift drivers are under constant supervision and observation by their department supervisor and leading hand. As a necessary part of my duties I am required to visit the warehouse where the forklift drivers operate on some 3 or 4 occasions each day for the purpose of performing a number of duties I take this opportunity on each occasion to observe forklift drivers operations to satisfy myself that they are properly adhering to OH&S rules and procedures. The aforementioned observation by the department supervisor and myself*

*provides a procedure whereby forklift drivers are regularly reminded of the company's priority concern with the observation and maintenance of proper OH&S procedures....'*

**An initial induction and training process for employees includes:**

*'training is in all aspects of forklift and material handling relevant at the premises of the company. The total period of time over which this process occurs is 4 months. The inductee is not under the direct supervision of the experienced forklift driver for all of this time, but only part. When the experienced forklift driver advises the supervisor that he feels the inductee is competent the inductee is allowed to carry out the functions of the position under the direct supervision of the supervisor and leading hand.'*

**In addition:**

*'Further training needs are assessed on an annual basis or as required by way of observation by the supervisor, leading hand, and department manager. On an annual basis each forklift driver is reviewed in regard to matters of performance and safety. Discussions are held between the supervisor and the employee depended on the assessment as to any further requirement for training in specific areas. Any forklift drivers found to be in contravention of OH&S standards are directed by the supervisor or the department manager to undertake a review of training.'*

**Mr. Amer considered that Hinterholzl was a competent operator and there had been no occasions over the 8-year period where he was warned for any breach of safety procedures and rules.**

**Mr. Amer said that in addition to a rollover cage, a seat belt was fitted but drivers will not use the belts. It appears that the failure by operators to use a seatbelt was not regarded as a breach. Before the incident, Amer stated that there had been a number of forklift safety initiatives. By way of selected example:**

*'...3. November 1996 Video "Forklift Operator Training and Safety" shown to warehouse personnel with discussion following....*

*...5. April 1997 Safety edge installed along loading bay to prevent forklifts from running over the edge when being put away for battery charging.*

*6. April 1997 Forklift daily safety inspection system instigated.*

*7. June 1997 Forklift speed restriction instructions given to forklift drivers and in particular in the production area...*

*...9. June 1997 Forklift drivers notified that all forklifts would have safety devices such as flashing lights and reversing beepers installed on them by the end of the month...*

*...12. October 1997 Forklift drivers instructed on safe operations of forklifts in pedestrian areas following a written warning given...*

*...15. November 1997 Discussion and memo issued in reference to the carrying or double stacks of pallets following the issue of a verbal warning...*

*18. May 1998 Purchase of unloading ramp to improve safety in the unloading of containers.*

*19. July 1998 Forklift drivers instructed and written memo issued in reference to the correct use of brakes on forklifts...'*

Apparently, following the incident, additional work has been undertaken on pedestrian safety (separation of forklifts and pedestrians), documented examination of operators and continuous safety meetings.

4. Mr. Patrick Gaffney, field service supervisor, Crown Equipment Pty. Ltd. inspected the scene and the forklift. The forklift was taken to Crown's workshops and inspected the next day. No mechanical problem was discovered. It had been regularly serviced by Crown.

Crown provides a '*HAZARD AND RISK ASSESSMENT*' for each of its forklift models when requested by a customer. The risk assessment for the unit involved showed that '*Tip over*' was a '*Potential hazard*' with a '*Risk Ranking*' of '*C2 = 8*'. The '*Control methods*' to manage the risk included '*2. Never travel with loads in a lifted position...*' and '*3. Always wear the seat belt. Read and obey the warning signs attached to the truck. Stay within the confines of the operator compartment. Employers should ensure that a hazard and risk assessment is completed for the operators duties and that a Safe System of Work is in place.*'

Mr. Gaffney considered it was unlikely that this '*Hazard and Risk Assessment*' was undertaken at Australian Pacific Paper at the time of delivery of the unit. The unit was delivered in 1994 and the '*Effective date*' of the risk assessment document was marked 1 July 1997. Gaffney was not aware of details of a previous form or whether a like form existed. It would appear that the form was introduced following changes to the regulations by the introduction of the Victorian *Occupational Health & Safety Plant Regulations (1995)* which required individual hazard assessment for units of plant.

The Crown Operator Manual for the forklift provides a number of warnings. (The warnings are quoted in part and are relevant for this case only). The warnings include:

*'You or others around you can be seriously injured or even killed if you are not careful or don't know how to use this truck correctly.'*

*Fasten your seat belt before operating the truck.*

*Head, arms, hands or legs outside the operator area can be pinned or crushed whenever the truck is moving. Stay within the operator area and stop completely before getting off.'*

Under the heading '*KNOW THE HAZARDS - WEAR YOUR SEAT BELT*':

*'Falling from a truck can cause serious injury or even death  
Fasten your seat belt and pull it snug before operating your truck. Keep it fastened until you leave the truck  
Stay with your truck. Don't jump from a moving or falling sit-down rider truck.'*

And under the heading '*KNOW THE HAZARDS – AVOID FALLS AND TIPOVERS*' (provided with an illustration):

*'Tipovers are very serious accidents. You can be crushed or even killed by the falling truck if you try to jump clear. Keep your seat belt fastened, grip the steering wheel tightly brace your feet, and lean away from the direction of fall. The best way to prevent injury is to know where you are at all times and follow the rules of safe truck operation.'*

- *Travel with the load or forks close to the ground and tilted back. Watch for overhead obstructions. Perform all truck movements smoothly and at a speed that will give you time to react in an emergency.*
- *An unloaded truck can tip over also. Be just as careful using an unloaded truck as you are a loaded one.*

Also under **'DRIVE CAUTIOUSLY, BE ALERT'**:

*'Travel with the forks close to the ground and tilted up.'*

The forklift also has warning decals prominently displayed on the cage illustrating the danger of tipover and the need to wear the seatbelt.

Mr. Gaffney indicated that the particular model of forklift has been superseded by a new model called SC 3000. Essentially the design of the new forklift does not solve the problem associated with the death of Hinterholz.

During evidence Mr. Gaffney related the facts of another incident he investigated with a Crown 35 SC TT 240 forklift. Apparently this incident occurred in December 1999 where the raised masts on the reversing vehicle were caught by overhead structure and the operator managed to jump clear during the tipover.

Crown is about to establish a driver training facility in Victoria. It already operates a training centre in Sydney and has done so for four years.

5. Mr. Rasit Girgin, Workcover Investigator, attended the scene and conducted an investigation. He commented that there needed to be more supervision and effective control at the work site. Girgin considered that seatbelts were not practical. On viewing the procedures in operation at the factory at the time of the incident he considered that they *'were bordering on exemplary.'*

However, in spite of a record *'bordering on exemplary'* the employer did not insist that Mr. Hinterholz wore his seatbelt, which was contrary to the advice in Crown's instruction manual. The comment of the Workcover inspector that seatbelts are not practical is not accepted, as the use of seatbelts in these circumstances is critical to assist in reducing the risk of injury.

### Contribution

Mr. Hinterholz contributed to his own death by driving the forklift with the masts raised. The use of the seatbelt fitted to the forklift probably would have reduced the risk of fatal injury.

### Recommendations and Comments

I propose to forward the Findings, Recommendations and Comments to the Attorney General as a matter of information. I will also send the Findings to the:

- Minister for Workcover,
- Chief Executive Officer, Workcover Authority,
- Chairman, National Occupational Health and Safety Commission,
- Secretary, Transport Industry Safety Group,
- Chief Executive Officer, Victorian Employers and Industry Association,
- Secretary, Trades Hall Council,
- Managing Director, Crown Equipment Pty. Ltd. (in Australia also to be forwarded to the respective Managing Directors of Crown in Germany (Munich) and in the United States – New Bremen, Ohio),
- Dean of the Faculty of Engineering, Melbourne University (including the Head of the Manufacturing & Engineering Department),
- Dean of the Engineering Faculty, Monash University,
- Head of the School of Engineering, University of Ballarat, and
- The Director, Accident Research Centre, Monash University.

***`Forklifts - a useful tool but a potential work killer!'***

The issue of forklift related death and injury is of serious and continuing concern to the Coronial Service. Since 1985 in Victoria there have been 45 recorded deaths involving forklifts.<sup>1</sup> Those deaths involve pedestrians, operators, and, in one case, a child. They range from deaths on the wharves to small factories and timber yards. The problems vary from untrained operators or failure to separate forklifts from pedestrians to design issues with the equipment. Many of these issues have been dealt with in previous coronial investigations as far back as the late 1980's.

The 45 deaths are recorded as occurring in *`Transport & Storage'* (15), *`Manufacturing'* (13), *`Trade'* (11), *`Construction'* (2), *`Agriculture'* (2) and *`Not identified'* (2).

Already in Victoria since the beginning of January 2000 there have been three (3) deaths involving forklift operations. Last year there were four (4) deaths.

The sheer magnitude of the problem in Victoria is partially illustrated by the Workcover figures from September 1985 until January 2000 which were provided to the Coroner as part of the investigation into Mr. Hinterholz's death. Workcover's *`Profile – Standard Claims reported Sept 1985 onwards'* indicated a *`Profile'* for forklifts of types of accidents ranging through *`Falls/trips/slips; Hitting objects; Hit by moving object; Sound pressure; Body stressing; Heat/radiation/elect.; Chemicals/substances; Vehicle accident; Other.'* The cost of 5539 claims across all *`Forklift'* profile areas totals to \$101,168,367 over the 15 year period.

Where the classification *`Hit by moving object'* is used the total 15 year cost is \$37,524,534 and the term *`Vehicle accident'* the total is \$1,516,184. Other high claim areas are

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<sup>1</sup> Figures for other States and Territories in Australia are not available (Although with the introduction of the National Coronial Information System from July 2000 information on forklift deaths in most States and Territories from that date will be ascertainable).

*'Falls/trips/slips'* at \$18,288,252, *'Hitting objects'* at \$5,794,417, *'Body stressing'* at \$33,822,955 and *'Other'* at \$3,510,993.

**The Workcover figures also depict days compensated over the 15-year period at 539,332.**

The industries listed as being involved cut across Agriculture, Mining, Manufacturing, Electricity/Gas/Water, Construction, Trade, Transport/Storage, Finance/Property/Business, Public Administration, Community Service, Recreational/Personal Services and Other. The area of *'Manufacturing'* has by far the most claims with 2,624 recorded followed by *'Transport/Storage'* with 1,282 and *'Trade'* at 1056. The list then drops to *'Construction'* at 135 with the lowest number of claims to be found in the *'Public Administration'* sector with 7.

When it is noted that the above figures only *'partially'* illustrate the problem it must be remembered that the enormous social cost to numerous families, friends and work-colleagues of those seriously injured and killed is not counted. It is this social cost that should be thought of as a vital part of the full picture of work related death and injury.

Also the loss to industry production and the cost to the health sector is not counted in the Workcover figures.

With a total cost of 15 years of Workcover claims at \$101,168,367 for the *'Forklift'* profile there is a potential margin for increase in the area of resources in prevention. It is understood that the Workcover Authority is currently working with Monash University Accident Research Centre on the problem of forklift injury.

### *The need for design solutions to reduce the risk of tipovers with forklifts*

The incident under investigation in this inquest once again illustrates the difficulty of relying on training to avoid making an error. Once having made the error the manufacturer's instructions advise (with similar warnings contained in the July 1997 *'Hazard and Risk Assessment'*):

*'Tipovers are very serious accidents. You can be crushed or even killed by the falling truck if you try to jump clear. Keep your seat belt fastened, grip the steering wheel tightly brace your feet, and lean away from the direction of fall. The best way to prevent injury is to know where you are at all times and follow the rules of safe truck operation.'*

The problem is that many forklift operators do not wear seatbelts (even where fitted). An operator may be required to jump on and off from the forklift many times a day. The seatbelt (if fitted) is no doubt regarded as a nuisance as it slows work performance. However, an easily accessible seatbelt is vital for the safety of the operator. To reduce the risk of injury and death in the event of a tipover it is imperative that seatbelts be fitted to forklifts and that employers supervise the use.

It is easy to explain the incident on the basis of an error of Mr. Hinterholz in that he failed to lower the mast before driving forward and did not wear his seatbelt. In the case of *Kevin Gallagher-Green* the Coroner commented:

*Probably the most important lesson from events such as the one under investigation is to be found in a general comment in the 'Interim Australian Standard' - Safeguarding of Machinery Part 1 General Principles [AS4024 - 1992]:*

*''Accidents with machinery have often been attributed to ''unsafe acts'', when a more thorough study would have revealed a design deficiency which did not allow for typical human characteristics or behaviour''[p.8, 3.1].*

*This case is a prime example. Neither the HSO investigation nor BHP's subsequent approach to the event discussed this issue. The issue was alluded to in the comments [at inquest] by the Company's Health and Safety Manager, Mr. Clapp, when he cautions of the isolation system 'it does rely on behaviour, the danger warning tag system and there in lies its inherent weakness.'*<sup>2</sup>

The hazard of tipover has been well identified by the manufacturer. However, some of the attempts at avoidance of the hazard are principally aimed at the hapless operator (fit seatbelt 'grip steering wheel tightly brace your feet, and lean away from the direction of fall'). Generally this solution is flawed (as it is with the rolling tractor) as there is little time for the operator to make the correct decision (certainly if the seatbelt is not fitted or not used). Human reaction time is too slow for reliable safety decisions in such circumstances.

The error (of moving the forklift with raised masts) made by even the well trained operator in the context of a busy workplace can be fatal. It is this design issue that requires addressing by manufacturers. As observed in *Hinterholzl* not all operators will wear a seatbelt. Thus it is necessary, if the death and injury rate is to be reduced to consider improvements in forklift design.

The problem of tipovers is further illustrated by Crown's own investigator, Mr. Gaffney, who during the hearing into Mr. *Hinterholzl*'s death, related an incident that he had recently investigated. The incident investigated by Gaffney involved a raised mast on a reversing Crown 35 SC TT 240 forklift that was caught by an overhead structure. In that case the operator managed to jump clear during the tipover without suffering any injury.

Also the case of *Tony Macafee*<sup>3</sup> is not dissimilar from the design perspective to the incident under investigation in Mr. *Hinterholzl*'s inquest. In July 1995 *Macafee*, truck driver and unlicensed forklift operator, was driving a forklift<sup>4</sup> in the loading bay of a small food distribution company. The load on his truck had shifted and he needed to use the forklift to adjust the load. When he was adjusting the load *Macafee* was requested by another subcontractor working from the distribution company, to unload a pallet. He then drove off and attempted to drive the forklift with tynes raised approximately 1.8 meters, drove it between two vertical steel beams struck a horizontal beam with the raised mast and overturned. *Macafee* had picked up the pallet with tynes positioned at about 2 feet high. He jumped out of the unit and was struck by the rear corner of the rollover protection when it fell.

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<sup>2</sup> Kevin Gallagher-Green, Coroner's Case No: 1207/93.

<sup>3</sup> Coroner's Case No: 1988/95. Copy of finding attached.

<sup>4</sup> An inspection of the Coroner's file indicates that the forklift involved in the *Macafee* inquest was a NISSAN 25, Model PH02 powered by LPG with a maximum possible height for the mast at 5500mm and tilt back 6 inches.

In *Macafee* the mast on the high lift forklift had previously hit the steel beams in the depot. Apparently, if the tynes on the forklift were raised about 2 feet the mast would strike the overhead beam. One of the witnesses stated he had heard other persons hit the beam about once a fortnight. An employee of Sandmar, Mr. Dean Hys, had also hit the overhead beams with another forklift. He had also hit the vertical beams on a number of occasions. Hys stated:

*'On occasions the truck drivers have been told not to operate the forklifts. I have told truck drivers not to operate the forklift. I know of occasions where forklifts have struck the horizontal beam supporting the canopy. If you look around the structure you can see marks where the mast of the forklift has struck the horizontal beam...the forklift involved in the accident will strike the horizontal beam when the tynes are about 2 feet off the ground.'*

In May 1996, *Macafee* resulted in the following comments by the Coroner in the conclusion to the finding on how the incident occurred:

*'It was apparent from the evidence there was minimal supervision of truck drivers in the loading/unloading procedures. Supervision relied heavily on the managing director of the company, Mr. Margariti, to control the unauthorised operation of forklifts. He admitted that his 'staff had been a bit slack' in allowing one interstate operator to drive the forklift. Margariti was clearly aware that drivers had operated the forklifts without permission and the required licence.*

*Drivers had previously operated forklifts without any formal controls. Evidently on occasions drivers had been warned. There were no warning notices notifying truck drivers of the necessity to have the required forklift driver's Certificate of Competence.*

*The forklift masts had previously struck the horizontal beam. According to the summary provided in the investigator's report from the Health and Safety Organisation it was stated 'other licensed forklift operators have stated that they knew of the possibility of the mast striking the horizontal beam and they therefore took the necessary precaution of ensuring the mast was lowered...' As the deceased had not previously driven the forklift he was probably unaware of the hazard. There were no controls or warnings protecting operators or advising of the hazard.*

*There was no formal health and safety policy.'*

It can be observed from the facts of the two cases (*Hinterholz* and *Macafee*) that the supervision, work practices and systems at the respective workplaces were distinctly different. However, from the perspective of design and the propensity for forklifts with raised masts to tip the issues are the same. In *Macafee* the Coroner also made the following recommendations and comments (in part) under the heading *'Design of rollover protection for forklifts'*:

*'As the deceased was injured by the rollover protection when he tried to jump clear of the unit this issue may need further examination by designers and manufacturers of rollover protection structures for forklifts. Partial cages or seat belts may be solutions that need consideration. The coronial service has seen a limited number of examples of injuries from*

*rollover protection structures in tractor rollovers. Although the addition of the structure is proven to significantly reduce the death and injury rate other measures may be necessary to ensure maximum protection in the case of a rollover.*

#### **Recommendation 4**

*It may be appropriate for the Health and Safety Organisation (with the Workcover Authority) to consider the issue of design of rollover protection structures/inclusion of seat belts for forklift trucks.'*

If the death and injury rate is to be reduced from forklifts the design solution is one aspect that requires to be tackled by the industry. Supervision at the work site is another. It is clear that much work has already been done by manufacturers like Crown in areas of fitting seatbelts, 'staging' combined with speed reduction devices, warnings in instruction manuals, hazard risk assessments and specialist training schools. However, there is one area that has far more potential yet to be realised – that of design solutions. Some suggested potential solutions in the area of tipover would be to:

- (a) reduce the staging speed for the raised mast to well below the 70 percent total as it is now;
- (b) provide side barriers (by way of partial cage or automatic drop-down side protection bars) to avoid the operator falling (or jumping) out of the forklift as it topples over;
- (c) provide speed cut out device where the forklift travels more than a short distance from the loading point with mast raised beyond a certain stage;
- (d) provide seatbelts that are easy to operate (even where operations require constant ingress and egress from the machine). The seatbelts should have interlocking and/or warning devices if not used; and
- (e) provide interlock and/or warning devices to prevent lack of use (or overriding of) safety equipment.

There are a number of manufacturers of forklift trucks across the world.<sup>5</sup> The particular safety devices operating on each different make or model have not been examined in any detail. However, in view of the magnitude of the forklift injury/death problem in a relatively small industrial and manufacturing state like Victoria, it would make some sense for all of the manufacturers to combine their resources to tackle the problem from a design perspective. The issue of tipovers is but an aspect of the broader design issue.

A recent United States publication titled '*Forklift Safety - A Practical Guide to Preventing Powered Industrial Truck Incidents and Injuries*' by George Swartz, indicates that there are some 101 fatalities in the United States involving powered industrial equipment each year. Tipover equates to 25.3% of the fatalities as identified by OSHA.<sup>6</sup>

It is noted that the issue of safe design is not isolated to the manufacture of forklift trucks. In coronial findings there have been comments about design and safety and the long-term role of

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<sup>5</sup>Main manufacturers include - LINDE; B.T.; RAYMOND; NISSAN; T.M.C.; KOMATSU; YALE; JUNG HEINRICH; TOYOTA; WILLIAM ADAMS.CAT; MITSUBISHI; HYSTER; CROWN; CLARK; SAMSUNG; SUMI; ETC.

<sup>6</sup>Swartz G - '*Forklift Safety - A Practical Guide to Preventing Powered Industrial Truck Incidents and Injuries*' Second Edition - Government Institutes (attached).

**industry and/or engineering educators in the area of design leading to improvements in injury/death prevention at work.<sup>7</sup> It is understood that university engineering department studies of Coroner's files are about to be undertaken in Victoria by students from the School of Engineering, University of Ballarat with the assistance of a scholarship from a large National corporate sponsor. New hazards or design solutions for industry may be discovered during this research.**

## ***Recommendation 1***

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<sup>7</sup> See especially Gallagher-Green recommendations 6 and 7 where the Coroner made the following comment:

*`Guarding of the tilt table adjustment area - automatic lockout/warning signs*

*One must not lose sight of one of the principal causes of this incident - the failure of the employer to adequately identify danger points on the Pickle Line and provide fail-safe guarding systems to avoid inadvertent entry into a hazard situation. Also there were no warning signs advising of the danger.*

*Although the eye beam was not normally visible, attention to detail when the machine was commissioned should have identified the potential nip point near the table adjusting nut under the tilt table. This area should have then been guarded. The system currently employed still does not fully address the risk of entry where the employee does not appreciate the hidden hazard.*

*It is of concern that apparently an `independent [engineering] investigation into the operation of the machine...disclosed no defect in it.' This investigation was undertaken by BHP. Clearly there was a hidden hazard - an engineering investigation should have identified this problem and provided solutions....*

*This is yet another case regularly observed in the coronial jurisdiction where original machinery design issues lead to potential for injury. In addition attention to detail in identifying hazards when commissioning plant is vital for the management of safety issues. Machinery manufacturers, designers, engineers and educational institutions have a role in this area.*

*Recommendation 6 - BHP [Western Port]*

*That BHP [Western Port] consider providing a secure fenced area with locked gate providing automatic lockout of the tilt table welding operation on entry. This would prevent inadvertent operation when an employee has entered the area.*

*In addition `Danger signs' need to be considered. Recommendation 7 - Engineering Department, Monash University*

*The findings are referred to the Engineering Department, Monash University with the intention of highlighting an opportunity for detailed research in this area.*

*Hopefully detailed research will lead to long term improvements in teaching, design and engineering solutions for safety problems.*

*Engineers, designers [with their associations] and machinery manufacturers would no doubt benefit from such research...'*

And see also Dimce Toderovski, Coroner's Case No: 487/93 - general comments on design review and the need to involve the Manufacturer in the investigation where a particular product is under scrutiny (Recommendation 2); Graeme Baker, Coroner's Case No: 2836/94 involving modifications to a Skid Steer Loader during maintenance - discussions about other inquest cases involving design problems with Skid Steer Loaders.

*The Victorian Workcover Authority consider discussing with Workcover Authorities in other States and Territories of Australia the issue of forklift related injury and death.*

*One aspect that may be considered appropriate to tackle is the area of design of forklifts with a view to seeking agreement of the forklift manufacturing industry to co-operatively examine issues of safe design and forklift trucks.*

*With tipovers of forklifts resulting in deaths this may be considered as an area that could be usefully and co-operatively tackled by all manufacturers. Some possible tipover design solutions that could be considered by manufacturers (if not already providing such solutions) would be to:*

- (a) reduce the staging speed for the raised mast to a very slow speed;*
- (b) provide side barriers (by way of partial cage or automatic drop-down side protection bars) to avoid the operator falling (or jumping) out of the forklift as it topples over;*
- (c) provide speed cut out device where the forklift travels more than a short distance from the loading point with mast raised beyond a certain stage;*
- (d) provide seatbelts that are easy to operate (even where operations require constant ingress and egress from the machine). The seatbelts should have interlocking and/or warning devices if not used; and*
- (e) provide interlock and/or warning devices to prevent lack of use (or overriding of) safety equipment.*

*The need to wear seatbelts to reduce the risk of injury in tipovers with forklifts – a warning to all relevant industries*

*In both the cases of *Hinterholzl* and *Macafee* the wearing of a seatbelt would probably have avoided the fatal outcome. Both the Workcover Authority and the forklift manufacturing industry should take every opportunity to advise about the risk of operating forklifts without wearing a seatbelt.*

*A 'Significant Incident Report' or 'Alert' may be necessary to remind all industries using forklifts of the need to have seatbelts fitted to forklifts (combined with rollover protection) and of the necessity of wearing the seatbelt to avoid injury in the event of a tipover.*

## *Recommendation 2*

*The Workcover Authority consider issuing a 'Significant Incident Report' or an 'Alert' to all relevant sectors of industry about the need to have forklifts fitted with seatbelts (combined with rollover protection) and of the necessity of wearing the seatbelt to avoid injury in the event of a tipover. The warning may need to include a 'line drawing' indicating how this type of incident occurs.*

*The Workcover Authority may need to work with the forklift manufacturing/repair industry to ensure that the warnings receive maximum and ongoing effect.*

*DSG Pty. Ltd. and the wearing of seatbelts on forklifts (combined with rollover protection)*

**In view of the circumstances of the incident that resulted in the death of its employee, Mr. Hinterholz, DSG Pty. Ltd should adequately supervise all of its forklift operators to ensure that seatbelts are worn (combined with rollover protection) at all relevant times.**

### ***The need for detailed injury incident reports from Workcover data***

**The Workcover statistical information on claims is exceptionally useful as an indicator of the problem in a particular area of work injury. However, its use is limited by the fact that the data is principally collected for claims information. In the event that the data included searchable 'summary incident' information there would be far greater potential to identify areas of failure (or factors) and developing hazards in work related injury incidents as they were recorded.<sup>8</sup>**

### ***Recommendation 3***

***The Victorian Workcover Authority consider including in its claims data summary incident information to assist in the timely identification of factors involved in injury related incidents including issues. Example factors would include issues such as:***

- (a) maintenance problems;***
- (b) equipment modification problems;***

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<sup>8</sup> See also Ieli Paulo, Coroner's Case No: 3630/94 where comments and recommendations were made in March 1996 on injury incident data collection in a case involving a crane loading operation. Under the heading 'Dangers associated with crane operations':

*'...It may be appropriate for the Health and Safety Organisation and the Victorian Workcover Authority to consider research into the extent of the problem [death and injury] to assist with the potential development of countermeasures.*

*During the inquest a request was made for detail on injury associated with crane operations and trapping spaces or nip points. Some information has been provided however it is not in a readily usable format. In order to identify the extent of the problem associated with a particular industry or work practice and develop effective recommendations it may be useful to have available and timely data on Injury rates [and circumstances]. The information also needs to be regularly directed to the Construction Industry [and to those who have responsibility for professional training] with suggestions for constructive and practical solutions.*

#### ***Timely death and injury Information – the potential for links***

##### ***Recommendation 5***

***The Victorian Workcover Authority and Health and Safety Organisation consider developing methods of ensuring appropriate work-related death investigations involving HSO are supplied with timely injury information to assist in the development of countermeasures and/or coronial recommendations.***

*It is understood work is currently being undertaken to improve the quality of work related injury data emanating from Workcover claims. The ability for future links between detailed death and injury information will be useful for the early identification of trends in work related injury and death and the extent of any problem. It will also be useful for a more thorough investigation into the causes.'*

- (b) design failures or problems;*
- (c) work system problems;*
- (d) training problems; and*
- (e) supervision problems, etc.*

**Graeme Johnstone  
State Coroner  
11<sup>th</sup> February 2000**

**Mr. Jim Parish for DSG Pty. Ltd.,  
Mr. Joseph Scarella for Crown Equipment Pty. Ltd., and  
Senior Constable Jeffrey Stewart Assisting the Coroner**

**ADDENDUM TO FINDING**

Shortly prior to delivery of the Finding in the matter of Friedrich Hinterholz a Preliminary Finding titled - '*Work-related traumatic fatalities involving forklifts and design issues in Australia, 1989 to 1992*' was delivered to the Coroner from the Epidemiology Unit of the National Occupational Health and Safety Commission. This document arrived too late to include in the body of the Finding.

The information in the Preliminary Report came from a work-related fatality study which was undertaken by the Commission between 1989 and 1992 from Coroners' files throughout Australia. During that period across Australia there were 50 deaths of workers or bystanders relating to forklifts.

The Preliminary Report makes a number of recommendations in relation to design issues relevant to forklifts. The authors comment (at the top of page 7) that recommendations were made in 25 of the deaths by a Coroner or health and safety agency. The authors note, '*There were several occasions on which seat belt use and/or installation was recommended.*' The Preliminary Report makes significant recommendations which no doubt should be seriously considered by the forklift manufacturing and supply industry. The regulators may need to consider mandatory compliance. (Report attached, 34 pages)

Graeme Johnstone  
State Coroner  
11<sup>th</sup> February 2000

