

# The Injaka Bridge disaster, 1998

**T**he Injaka Bridge construction project is a Department of Water Affairs (DWA) project to build two road bridges over deep river valleys near Graskop and Bushbuckridge in Mpumalanga.

On 6 July 1998, members of the public were invited to view the construction project. Some were standing on the partially-built deck of the largest bridge when the whole structure collapsed, killing 14 people and injuring 19. Some of the dead were construction workers employed by Concor, the construction company, and an engineer employed by VKE, responsible for the design and engineering aspects of the project. Others were spectators not employed by either company.

The collapsed bridge is being rebuilt and is nearly complete. However, more than two-and-a-half years later the Department of Labour inquiry into the incident in terms of the Occupational Health and Safety Act (OHSA) is not yet complete. There is no decision on whether anyone will be prosecuted under the Act, and none is expected until technical evidence is given and cross-examined. From there, the inspectorate must present any recommendations for prosecutions to the Attorney General, who will decide on whether to proceed with prosecution. If so, the case will go to a magistrate's court, and the legal argument will start all over

*Pete Lewis examines what happened at the Injaka Bridge disaster and the subsequent enquiry by the Department of Labour, and identifies lessons for occupational health and safety law and enforcement.*

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again. The maximum fine that can be levied under the OHSA is R100 000 or a prison sentence of two years in cases where an act or omission amounts to culpable homicide.

Because of the seriousness of the incident and the number of people affected, the labour inspectorate has taken the unusual step of commissioning an engineering consultant to carry out a preliminary inquiry under section 31 of OHSA.

A preliminary inquiry is designed to discover whether there is a necessity for a full formal inquiry under section 32. The engineer conducted an inquiry into the design, construction and working procedures at the site. His report severely criticises the project on all these counts, alleging serious errors by both the construction company (Concor) and the engineering company (VKE).

At the time of the disaster, Concor was

40% owned by a German company, Hochtief. Hochtief is a global engineering and design company that provides these services to governments in many developing and developed countries. Foreign contracts are an increasingly important part of Hochtief's business. Thus Injaka Bridge can be considered a case of technology transfer.

The particular technology applied at both the bridges is known as 'incremental launch'. For the bridge which collapsed, the tall pillars which would eventually support the deck of the bridge are first built in the valley, then the deck is built in 15 m reinforced and pre-stressed concrete sections in a casting bay on one side of the valley. The deck sections are then literally pushed out from the bay over the chasm one by one. While each section of the deck is being pushed out, construction workers are placed under the deck and they insert thick, heavy rubber/teflon rectangles (pads) between stainless steel temporary bearings between the deck and the structure over which it moves. The rubber pieces are sprayed, in this case, with ordinary household cooking oil for lubrication as the massive deck sections slide out over the pads.

This process is extremely delicate, and only bearings and pillars support the huge concrete and steel deck as it makes its dizzying way over the valley. The tolerances for error in the slide path of the deck are extremely small (millimetres not centimetres), and if friction builds up at the bearings it could put immense strain on the support pillars.

To add to the complexity, the bridge design is curved, which makes the calculation of the slide path, and the control of the deck as it moves along the path, extremely sensitive. There are an enormous number of risk factors ranging from ground stability, quality of materials,

monitoring of the slide path accuracy and cracking of decks and pillars during launching, and working procedures and supervision of labour. A break or serious rupture of any of the component parts (deck, pillars) can, and did, cause almost complete collapse of the structure as a whole.

The incremental launch technique of bridge building was developed in Europe in the 1970s. It is usually executed with 'fail-safe' measures that make it almost impossible for anyone to be killed or injured if the bridge collapses during launching. This requires complete automation of the ramming process, and measurement of the path of the deck as it moves out over the valley. The ram operator sits in a cab at a safe distance from the ram, and automatic sensors relay digital messages constantly back to him/her. There are also automatic safety devices that override the ram operator and halt the launch if the slide path varies from its design tolerances, or if friction build-up is too great. The stresses and strains in the structure during launching and any resulting cracking are monitored automatically.

However, the technology was not transferred to South Africa with any such fail-safe features, and the method of launching was considerably more labour intensive, with employees required on and around the structure during the entire launching process. Evidence given in the inquiry revealed that cracking of the deck structure, for example, was supposed to be reported by workers on the pillars shouting across the valley to the casting bay - there was not even a walkie-talkie or radio system of communication. Monitoring of the slide path of the decks was not automatic, but subject to human observation error, with no automatic cut-out of the ram if the slide path deviated from design.

## Pressure on workers

Work during the launching phase was intense, and there were many minor and not so minor injuries amongst workers because the company had set the goal of launching one section of the deck per week. This meant working three hours per day compulsory overtime for many of the workers, as well as working on Saturdays and Sundays to complete the schedule.

Concor contracted 'permanent' or experienced long-term employees who had worked for the company at other sites, as well as casual workers from Bushbuckridge. Three had been hired on the day the bridge collapsed. One of them alleged on oath at the inquiry that he and one other casual had been given hard hats and put to work on the site with no safety instruction (beyond the order to wear a hard hat at all times on the site) and no other safety equipment or clothing. He said they had replaced two permanent workers who normally worked at the top of the pillars. They had been ordered to climb to the top of two of the pillars and join the two permanent workers who were feeding slip pads into the bearings under the deck. They were told how to do this by the permanent workers already in position. They had both fallen from the top of the pillar when the structure collapsed, but only one survived to give evidence. He



*OHSA regulates health and safety.*

also told the inquiry that he had seen cracks in the deck above his head earlier in the day when the collapse occurred, but had not known what to do about them.

## Department of Labour inquiry

The Department of Labour's formal inquiry was completely overshadowed by the possibility of civil damages claims arising from the disaster. Both Concor and VKE had powerful legal teams to defend their rights during the inquiry. VKE did this first by delaying the date of the first hearing of the inquiry through a high court injunction on the grounds that they

had not yet completed their own internal technical inquiry. The public hearing finally began in November 1998 and was attended by workers and family members of the many dead. VKE lawyers began by calling for the presiding officer (a Department of Labour inspector) to stand down on the grounds that he had no right to discuss the labour department's engineer's report with the author, as this rendered him unable to conduct the inquiry in an unbiased manner.

VKE lawyers threatened that if the presiding officer did not recuse himself they would seek a judicial review of the proceedings. They also stated that they would 'reserve their position' on whether the labour department's engineer's report could be considered as evidence in the inquiry. They ended their first statement by demanding that the hearing be adjourned. The presiding officer took lengthy advice in a recess, and by midday the hearing was closed with no evidence having been heard about the deaths and injuries. The presiding officer refused to stand down, stating that he had acted within the powers granted to the inspectorate in OHSA. In the event, the department decided to replace him to avoid any further legal wrangles over his alleged 'bias', and VKE did not attempt to get a judicial review.

When the inquiry was reconvened, VKE and Concor lawyers attended at all stages and cross-questioned witnesses. Their cross-questioning tried to get into the record anything that would cast doubt on any statements that suggested that their clients had been negligent in any way, or to shift blame from themselves to the other company.

Why was there such strong legal defence at an inquiry that was merely to establish the causes of the disaster, and to allow the Department of Labour

inspectorate to form an internal view on whether a breach of OHSA had taken place, and by whom? The answer is probably the possibility of civil damages actions that might follow, where proven negligence could result in substantial financial settlements.

The fact that all employees of Concor and VKE were covered for compensation by the Compensation for Occupational Injuries and Diseases Act, 1993 (COIDA) means that they cannot sue their employer. However, they can sue third parties. So Concor employees could sue VKE, and VKE employees could sue Concor. The high cost of such legal action and the inadequacy of state legal aid would probably prevent Concor workers' families taking legal action. However, members of the public and the engineers who were injured or died in the accident might have the resources to take legal action. Such damage suits could amount to very high settlements if successful, since the court would have to consider lost earnings, pain and suffering, and rehabilitation costs.

These dynamics have relegated the labour inquiry to the status of a sideshow for Concor and VKE. How can this be avoided? How can the integrity of labour inquiries into deaths be maintained? How can labour department inquiries into serious incidents like Injaka Bridge be linked back quickly to preventive action to improve the situation in the construction industry, or any other industry for that matter?

### **Administrative enforcement**

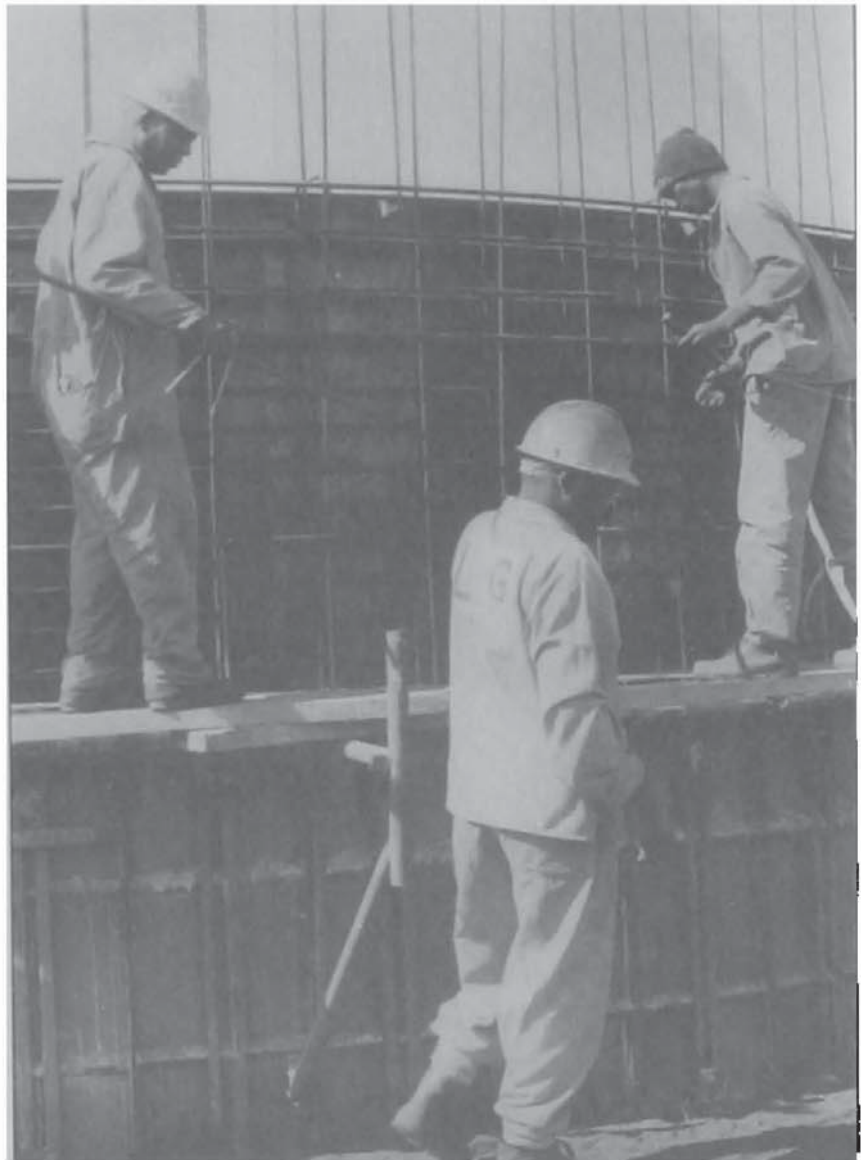
The more advanced model of the Mines Health and Safety Act, 1996 (MHSA) should replace the older, less effective model of the Occupational Health and Safety Act, 1993 (OHSA). MHSA is acknowledged as one of the most advanced mining health

and safety laws in the world in terms of its model of tripartism, enforcement, and worker empowerment. The regulation of health and safety in other sectors of the economy through OHSA lags far behind. This includes the system of law enforcement, which is more rapid and prevention-oriented in MISA than that in OHSA, as well as:

- the structures and procedures for worker representation in health and safety monitoring and control at workplace level;
- the 'right to refuse dangerous work'.

Similar to OHSA, MISA provides for criminal prosecution via the magistrate's courts on recommendation from the Inspectorate to the Attorney General. The crime of committing an act or omission that leads to a threat to the health or safety of anyone in a mine is explicitly recognised

as an offence. Prison sentences are specified, but there is no maximum fine specified in the event of a successful prosecution. The most important innovation in the MISA is the addition of administrative fines that can be recommended by any mine inspector to the regional director of mines, who must confirm whether the fine should stand. There is an appeals procedure in which the final arbiter is the labour court - a non-criminal court skilled in interpreting industrial relations situations, which play a large part in health and safety matters. Any fines that the inspectorate collects are placed in a fund that is explicitly



*Are construction workers adequately protected by OHSA?*

designated for improving health and safety in mines. The amount and the reason for the fine must be posted in a prominent place in the mine.

This new system has had a significant effect on the activities of the mines' health and safety inspectorate since 1998. In the ten years before 1996, there were an average of 108 prosecutions per year (a total of 1 086), but only 44% of these were successful prosecutions. Fifty per cent of the inspectorate's recommendations for prosecution to the Attorney General were declined. The majority of fines were levied against semi-skilled or unskilled workers - a classic case of 'victim-blaming'. Top

managers were only 26% of those successfully prosecuted. The fines were very small.

In contrast, since the new system, from 1998 to July 2000 there has been a large increase in the rate of fining and the average amounts levied in fines. All fines have been levied through the administrative system, rather than through criminal court cases. In those two years, the amount of fines levied has been 33% of the total number levied during the ten years to 1996, which shows a definite pick up in the fining rate. The total amount levied is nearly R1-million, of which R233 150 has been recovered so far. There is no detail available on whether the previous tendency towards 'victim-blaming' has been reversed.

If all fines levied are recovered, there will be a significant amount of revenue available for improvements in health and safety in the mines. One appropriate way to spend this money would be to finance the independent training of full-time health and safety representatives elected by trade unions at mines in terms of the MISA.

Another interesting aspect of the administrative justice system in the MHSA is that although there were seven appeals against fines levied by regional directors of the Inspectorate, none of them was successful, and none of them has reached the labour courts. All cases that were referred to the labour court were in fact settled out of court between the inspectorate and the person/s being fined.

The record of enforcement in non-mining industry is like that of the mining industry before the change to administrative fines. The May 1997 report of the Labour Ministry Committee of Inquiry into a National Health and Safety Council in South Africa pointed out that only one in ten cases referred by the

inspectorate to the Attorney General actually went to prosecution. Where prosecutions were agreed and successful, the most common outcome was a small 'admission of guilt fine' of the order of R500. The Department of Labour reports for 1988 and 1999 say that only 4% of contraventions cited against employers were recommended for prosecution. In those two years nearly 1 000 workers died at work in non-mining industries, and there were around 7 600 incidents reported, the majority of which resulted in workers being off work for more than 14 days.

## Conclusions

The record of the MHSA system of administrative fines is very positive on a number of counts, and would have been of great benefit in the Injaka Bridge case. Firstly, penalties are issued more quickly than under the previous criminal prosecution system. This enables inspectors' activity to be focused on the lessons to be learned from accidents, and to communicate that forcefully to mine managers and employees.

Secondly, linking fines to financing improvement activities converts the administrative process into a sort of dedicated taxation system on mines, which is a potentially powerful lever towards prevention. Thirdly, because the administrative justice system does not substitute for the criminal procedure system, particularly negligent breaches of the MHSA can still be punished under criminal law by large fines or imprisonment of individuals. Fourthly, MHSA states that the fine and the reasons for it have to be posted openly at the mine, which improves the flow of information where it matters most – prevention.

What more can be done? The following steps would greatly improve the potential



*Trade unions can take steps to impact on dangerous working conditions.*

for trade unions to have an impact on the desperately hazardous and unhealthy situation for their members on construction sites, especially in civil engineering, and indeed in all non-mining industries.

Replace the OHSA by a statute in line with the MHSA. This should include the following key elements:

- The right of workers to refuse dangerous work, and an obligation on employers to negotiate with representative unions a procedure to resolve such cases, including representation of refusing workers, and referral to outside arbitration where necessary;
- Election of full-time worker health and safety representatives, by agreement between employers and representative unions.
- Empower the labour inspectorate to levy fines administratively for contravention of OHSA or its regulations, without recourse to

criminal courts, and with an appeal to the labour court in the final instance.

The reasons for the fines should be communicated to all parties with recommendations for prevention of accidents. Such a system should run alongside the criminal prosecution route that should be maintained. It should also be accompanied by a determined training programme to prepare the inspectorate for their new powers, procedures and duties.

- Fines collected should be spent on activities which promote health and safety at work, in accordance with priorities identified by the Department of Labour in consultation at national level with employers and trade unions, in the appropriate forum, which would be the Advisory Council for Occupational Health and Safety at present. ★

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