

SUPREME COURT OF QUEENSLAND

CITATION: *CFMEU v State of Qld and Anglo Coal* [2005] QCA 127

PARTIES: **CONSTRUCTION, FORESTRY, MINING & ENERGY UNION**
(applicant/respondent)
v
STATE OF QUEENSLAND
(first respondent)
ANGLO COAL (GRASSTREE MANAGEMENT) PTY LTD ACN 078 099 313
(second respondent/appellant)

FILE NO/S: Appeal No 6191 of 2004
SC No 9823 of 2003

DIVISION: Court of Appeal

PROCEEDING: General Civil Appeal

ORIGINATING COURT: Supreme Court at Brisbane

DELIVERED ON: 27 April 2005

DELIVERED AT: Brisbane

HEARING DATE: 10 November 2004

JUDGES: McPherson JA, Fryberg and Mullins JJ
Separate reasons for judgment of each member of the Court, each concurring as to the order made

ORDER: **The appeal should be dismissed with costs**

CATCHWORDS: MINING LAW – Statutory regulation of conduct of mining operations – Regulation as to safety of mines and machinery – In general and definitions – Construction of ‘reasonably foreseeable event’

Coal Mining Health and Safety Regulation 2001 (Qld), s 148, s 296, s 296(1)

Tame v New South Wales (2002) 211 CLR 317, cited
Wyong Shire Council v Shirt (1980) 146 CLR 40, referred to

COUNSEL: H B Fraser QC, with P P McQuade for the appellant
M D Hinson SC, with D R Kent for the respondent

SOLICITORS: Blake Dawson Waldron for the appellant
Hall Payne Lawyers for the respondent

- [1] **McPHERSON JA:** I agree with the reasons of Fryberg J for dismissing this appeal.
- [2] **FRYBERG J:** Grasstree is a new underground coal mine near Middlemount in central Queensland's Bowen basin. It is operated on a day-to-day basis by the appellant ("Anglo").¹ Many of Anglo's employees at the mine are members of the respondent ("the CFMEU"). Development of the mine began in 2001. A permanent workforce began underground development operations in October 2003. Full production is expected to begin in 2006; however about 10 per cent of the extractable reserves of coal will by then have been produced through the development process. That process involves sinking vertical shafts and driving a number of more or less horizontal underground roadways around and between the shafts. It involves preparation of the underground area for longwall mining. The underground section of the mine was described by the trial judge in the following terms:

"It presently comprises some five kilometres of underground roadway which is connected to the surface by two vertical shafts. One shaft, described as the intake shaft, delivers fresh air from the surface to the mine. The other, described as the exhaust shaft, is fitted with exhaust fans drawing air from the mine. In this way air is drawn into the intake shaft, along the underground roadways and up through the exhaust shaft. Persons enter and leave the roadways usually through the intake shaft. But the exhaust shaft has a facility for transporting persons in the event of an emergency. There is a conveyance which can take up to ten people at a time and a round trip for that facility takes no longer than five minutes. The intake shaft is 6.1 metres in diameter and the exhaust shaft is 5.6 metres. Both shafts are fully concrete-lined, the concrete being at least 150 millimetres thick. Each shaft is approximately 280 metres deep and the distance between the two is approximately 200 metres via the underground roadways."

- [3] In October 2003 the CFMEU began proceedings for a declaration that the two entrances from the surface were not escapeways within the meaning of s 296(1) of the *Coal Mining Safety and Health Regulation 2001*. After a three-day hearing, McMurdo J made the declaration sought on 18 June 2004. This is an appeal against that order.

The legislation

- [4] Section 296 must be considered in its legislative context. That context was summarised by McMurdo J and with one addition it is convenient to adopt his Honour's summary:

"[5] The objects of the Act include the protection, safety and health of persons at coal mines and the maintenance of an acceptable level of risk of injury to any person resulting from coal mining operations: s 6. According to s 7, those objects are to be achieved by:

¹ Although an associated company is the "coal mine operator" within the meaning of s 21 of the *Coal Mining Safety and Health Act 1999*, no point has been raised regarding Anglo's standing as the proper party to respond to the originating application.

- ‘(a) imposing safety and health obligations on persons who operate coal mines or who may affect the safety or health of others at coal mines; and
- (b) providing for safety and health management systems at coal mines to manage risk effectively; and
- (c) making regulations and recognised standards for the coal mining industry to require and promote risk management and control;
- ...’

[6] Safety and health obligations are imposed by sections 39 to 47. Certain obligations are imposed upon the coal mine operator by s 41, including that of ensuring that the risk to coal mine workers is at an acceptable level.²’

- [5] “Risk” is defined to mean the risk of injury or illness to a person arising out of a hazard. The Act provides that risk is measured in terms not only of likelihood but also of consequences.³ His Honour's summary continued:

“Section 42 imposes obligations on the site senior executive, the first of which is to ensure that the risk to persons from coal mining operations is at an acceptable level.⁴ Whether a risk is of an acceptable level is affected by s 29 which is in these terms:

‘29 What is an acceptable level of risk

- (1) For risk to a person from coal mining operations to be at an **“acceptable level”**, the operations must be carried out so that the level of risk from the operations is—
 - (a) within acceptable limits; and
 - (b) as low as reasonably achievable.
- (2) To decide whether risk is within acceptable limits and as low as reasonably achievable regard must be had to—
 - (a) the likelihood of injury or illness to a person rising out of the risk; and
 - (b) the severity of the injury or illness.’

[7] Where a person owes an obligation to achieve that acceptable level of risk, such as the obligations prescribed by s 41 and s 42, s 37 and s 38 provide for how that obligation can be discharged. Section 37(1) provides that if a regulation prescribes a way of achieving an acceptable level of risk, a person may discharge the obligation in relation to the risk only by following the prescribed way. Section 38 provides that if there is no regulation (or recognised standard) prescribing a way to discharge a person’s obligation, then the person must choose an appropriate way to do so, which must involve the taking of reasonable precautions and the exercise of proper diligence. So the evident intent is that in some circumstances, a duly made regulation will itself define what constitutes an acceptable level of risk, by defining what can and must be done to achieve it. In other cases, the person obliged to achieve an acceptable level of risk is left

² Section 41(1)(a).

³ Section 18.

⁴ Section 42(a).

to choose what is appropriate, subject to requirements of reasonableness and proper diligence and to the condition (from s 29(1)(b)) that the level of risk from the operations is as low as reasonably achievable.

[8] Section 282 of the Act empowers the Governor-in-Council to make regulations, including a regulation about any matter mentioned in Schedule 2. The matters in Schedule 2 include “prohibiting anything, or prescribing anything, to achieve an acceptable level of risk”⁵ and the specific matter of “exits in underground mines from workings to surface”.⁶ Pursuant to s 282, the *Coal Mining Safety and Health Regulation* 2001 has been made, of which Chapter 4 prescribes ways of achieving an acceptable level of risk at an underground mine in certain circumstances.⁷ Part 9 of Chapter 4 provides for mine design, and Division 4 of that Part, comprising s 296 through s 299 of the Regulation, provides for “Escapeways and Refuges”. The relevant provision in this case, which is s 296 of the Regulation, is thereby a regulation which prescribes a way of achieving an acceptable level of risk, so as to engage s 37 of the Act in relation to the site senior executive’s obligation to ensure that the risk from coal mining operations is at an acceptable level. There is no challenge to the validity of s 296. Accordingly the discharge of the site senior executive’s obligation requires his compliance with s 296 of the Regulation, irrespective of the executive’s own judgment as to whether there is another appropriate way to achieve the same level of risk. Compliance with s 296, where it operates, is not excused by the design of the mine in a different way although another design might represent reasonable precaution and diligence. In circumstances in which regulations such as s 296 operate, the Governor-in-Council has exercised its power to decide what is an acceptable level of risk, by prescribing the way of achieving it.

[9] Section 296(1) of the Regulation is in these terms:

‘Escapeways

296(1) The site senior executive must ensure the mine has at least 2 trafficable entrances (“**escapeways**”) from the surface that are separated in a way that prevents any reasonably foreseeable event happening in 1 of the escapeways affecting the ability of persons to escape through the other escapeway.’”

The decision at first instance

[6] It was common ground between the parties that the two shafts were trafficable entrances from the surface.⁸ McMurdo J held that a fire in the intake shaft would contaminate the air throughout the mine (including the exhaust shaft) and thereby require a person who was escaping to wear protective equipment at all times until he

⁵ Clause 2 of Schedule 2.

⁶ Clause 31 of Schedule 2.

⁷ See s 148 of the Regulation.

⁸ Although the site senior executive was not a party to the proceedings the parties accepted that his absence was immaterial.

or she reached the surface; and that such a fire was a reasonably foreseeable event. He further held that the happening of such an event would substantially affect the ability of persons to escape through the exhaust shaft, because they would be required to wear protective goggles and breathing apparatus in the approaches to and in the exhaust shaft. That equipment, he held, could impair visibility with associated risks of disorientation and an inability to locate people, designated escapeways or emergency equipment; and would cause those wearing it to lose their ability to talk to each other or to those on the surface. He found (implicitly) that a system which provided atmospheric separation between the shafts was a way which would prevent that ability to escape from being so affected, allowing escape through that shaft unimpeded by the equipment. It was not suggested that the mine had such a system at the relevant time. One could be created by constructing a second intake shaft. Such a shaft was planned, but not scheduled for construction until August 2005.

The arguments on appeal

- [7] The appellant advanced three principal contentions:
- “(a) The trial judge erred in fact in holding that the respondent had proved that either of the hypothetical “worst case scenarios” (both of which assumed that the whole contents of the fuel pod when in the intake shaft spilled, were ignited, and the fire was not immediately extinguished) was a “reasonably foreseeable event” within the meaning of that phrase adopted by his Honour, set out in paragraph 5(a)(i) above.
 - (b) The trial judge erred in that construction of ‘reasonably foreseeable event’.
 - (c) The trial judge erred in fact, and in the construction of the Regulation ... in holding that either hypothetical worst case scenario was an event ‘affecting the ability of persons to escape through the other escapeway’.”

The construction point

- [8] For the appellant Mr H Fraser QC submitted that the meaning of the expression “reasonably foreseeable” depended upon the context of the expression. He submitted that s 296 telescoped and modified the elements of duty, breach, causation and remoteness. The words were necessarily used in a different way from the common law. They required the reasonable foreseeability, in advance, of a particular event and inextricably from that question prescribed a response. In that respect they conveyed something different from the concept of reasonable foreseeability at common law. They required consideration of the effect of that predetermined response upon ability to escape. It was not possible to restate the meaning of the expression in other words; in this respect the expression resembled “beyond reasonable doubt”⁹. The requirement of reasonableness needed to be applied in a commonsense way.

⁹ *Dawson v The Queen* (1961) 106 CLR 1.

- [9] For the respondent Mr Hinson SC submitted that the expression bore its common law meaning. That meaning was expressed in the decision of the High Court in *Wyong Shire Council v Shirt*¹⁰. He submitted that s 296 did not telescope and modify the elements of common law negligence. Rather, it prescribed a standard of care to be achieved (separation of escapeways) by reference to a risk (a reasonably foreseeable event). It was wrong to apply the expression by asking whether the result of a particular construction was to require more than was necessary to reduce risk to an acceptable level. Compliance with the section was deemed to produce an acceptable level of risk (s 148). In the context of health and safety legislation it was not surprising to find an expression used in its common law sense.
- [10] To start the process of construction by asking whether the legislative intention was to catch up a meaning of “reasonably foreseeable” derived in the context of the law of negligence would in my judgment be to invite the risk of error. There are a number of reasons for this. First, there is nothing in the Regulation itself which suggests the existence of any such intention. Second, the contexts are different. The (common) law of negligence is primarily concerned with the allocation of the cost of losses that have already occurred. It may also be said to be concerned to deter careless conduct and encourage the taking of precautions in human activities, albeit that its strictures are expressed at a high level of generality. On the other hand the purpose of s 296 is to prescribe a way, indeed the only way, by which the site senior executive may discharge his safety and health obligation in the circumstances stated in the section. In other words its purpose is different from that of the common law and it operates before the happening of the event with which it is concerned, not after it. Third, the common law is concerned to provide general rules for the whole of society; it is addressed to ordinary people (the passenger on the Clapham omnibus or the Bondi tram¹¹). The Regulation is addressed primarily to mining companies and their senior officers and to lawyers and courts. Fourth it seems that in any event, there is no one meaning for the expression in the law of negligence. It may have different connotations depending upon whether it is relevant to the existence and scope of a duty of care, breach of duty or remoteness of damage.¹²
- [11] That is not to say that cases on the meaning of the expression at common law are to be disregarded. The words are common English words and the problems to which they give rise may exist in more than one context. Cases on negligence may demonstrate reasoning which happens to be equally applicable in the context of the Regulation. In considering the cases, however, it must be borne in mind that the object is to determine the correct interpretation of the section.
- [12] As described above, s 296 is contained in Division 4 (“Escapeways and refuges”) of Part 9 (“Mine design”) of Chapter 4 (“Underground mines”) of the Regulation. Division 4 contains three other sections, dealing with headings for intake air, the maintenance and designation of a primary escapeway and provision in the safety and health management system for the safety of persons when only one escapeway from the mine is available for use. Other divisions of Part 9 deal with mine plans, establishing and identifying explosion risk zones and precautions against inrushes.

¹⁰ (1980) 146 CLR 40.

¹¹ Fleming, *The Law of Torts*, 9th ed (1998), p 118; and see the other formulations there cited.

¹² *Wyong Shire Council v Shirt* (1980) 146 CLR 40 at p 47 per Mason J; *Tame v New South Wales* (2002) 211 CLR 317 at p 331 per Gleeson CJ.

Other parts of Chapter 4 deal with rescue and communication, electrical equipment and installations, explosives and explosive powered tools, gas monitoring system, mechanical, mining operations, ventilation and working and environment. As already noted the chapter prescribes mandatory ways of achieving an acceptable level of risk in an underground mine. The objects of the Act include to protect the safety and health of persons at coal mines and to require that the risk of injury or illness from coal mining operations be at an acceptable level.¹³

- [13] The environment in which Chapter 4 of the Regulation operates, underground coal mines, was described in evidence. That evidence disclosed, if evidence were needed, that underground coal mining is an extremely dangerous undertaking. One of the greatest dangers is a fire. A fire in an underground coal mine affects not only persons in its immediate vicinity but all persons who are underground at the time. For this reason ventilation and escapeways are extremely important aspects of mine safety. Compared to other countries mine safety accidents in Queensland coal mines are relatively infrequent. Deaths have been relatively few, although, of course, any death is too many. It is reasonable to assume that in part this is the result of the provisions in the Act and Regulation and, perhaps, their predecessors. No doubt it is also due to the precautions adopted by mine owners and operators and the scrutiny of unions such as the applicant. If one were to ask, what are the probabilities, based on recent statistical history, of a serious accident occurring in a Queensland coal mine tomorrow, the answer may well be, very low. One would hope that this would be the answer. If it were not the Act would be failing to achieve its stated objects.
- [14] “Reasonably foreseeable event” in s 296 must be construed against that background. The section is to be applied before the relevant event has happened; it operates prospectively. It demands the postulation of a hypothetical event. That event must be able to be envisaged in advance of its happening. The person carrying out the exercise, typically the site senior executive, must make a judgment on the basis of known information. That information will include data about previous events of a type similar to that hypothesised. In my judgment the exercise must necessarily involve an assessment of the probability of the event. “Foreseeable” is a qualitative description of a level of probability.
- [15] That view has not found much favour in the context of the law of negligence. In *Tame v New South Wales* Hayne J said:

“As Dixon CJ pointed out in argument in *Chapman v Hearse*, the difficulty in using reasonable foresight of harm as the criterion for ascertaining duty is that ‘reasonably foreseeable’ carries with it no idea of likelihood. If an event has happened, it is very hard indeed to say that its happening was not foreseeable ‘by a person of sufficient imagination and intelligence’.”¹⁴

Assuming that his Honour used likelihood as a synonym for probability, that proposition, if applied to the interpretation of s 296, might be thought to be at odds with what I have said in my previous paragraph. I do not think that is so. I understand Hayne J (and Sir Owen Dixon) to have been making the point that “foreseeable” is not a quantitative expression of probability. With that I agree. I

¹³ Section 6.

¹⁴ (2002) 211 CLR 317 at p 401.

also agree that it is difficult to say of an event after it has happened that its happening was not foreseeable by a person of sufficient imagination and intelligence. That simply illustrates the extremely wide ambit of the words.

- [16] Before the event the position is somewhat different. The event and the sequence of happenings which caused it have not occurred. There is no single set of facts for the mind to focus on. Scenarios may be imagined at various levels of abstraction and ranked in accordance with the probability and consequences of their occurrence. Professor Joy, the principal of a consultancy company specialising in risk assessment, spent two days as facilitator with a team of managerial and technical staff from the Grasree mine carrying out such an exercise in relation to hypothetical single basic events at the mine in December 2002. There is, however, a limit to the amount of time and effort which can in practical human affairs be devoted to the exercise. No doubt consideration of the multitude of permutations and combinations of causes that can lead to a particular event is assisted by computer analysis; but even that has its limits. That is particularly true of events with multiple concurrent causes. By definition if no one can imagine an event it is not foreseeable. But an event is not unforeseeable simply because no one has taken the time or trouble, or had the patience, to think about the way in which it might be caused for long enough or in sufficient detail.
- [17] This quality of “foreseeable” colours the meaning to be ascribed to “event” where it occurs in s 296. The section requires the site senior executive to ensure the existence of escapeways which have a certain quality or property. That property is described by use of the words presently being construed. To perform his or her duty the executive must be able to measure that property. Unless the section is construed in such a way that he is able to perform his duty it is deprived of utility. If the event referred to in the section is to be foreseeable it must be described at a level of generality capable of comprehension and analysis by the executive. That means that it must necessarily be an event which is (or may be) a consequence of a multiplicity of causes operating either in succession or concurrently. The need for the event to be described at a level of some generality is of significance in the present appeal.
- [18] Foreseeability bounded only by the limits of human imagination would indeed be an impractical instrument by which to regulate human affairs, particularly mine safety. Imagination is sometimes an uncontrolled instrument. It is capable of rational analysis; but it is also capable of fancy and superstition. It is not every foreseeable event which the site senior executive must consider under s 296; it is only those events which are “reasonably” foreseeable.
- [19] In the context of s 296 “reasonably” has at least two functions. First, it implies compliance with the laws of science. It operates to exclude supernatural intervention from the range of things foreseeable by the exercise of the imagination. As scientific knowledge progresses the ambit of what is thereby excluded may change. From time to time problems may arise in relation to events which the imagination can foresee but which science can neither prove nor disprove. Those problems may be dealt with if and when they arise. In the context of coal mine safety a cautious approach would be understandable. Second, “reasonably” moderates the level of probability (or perhaps more accurately, improbability) comprehended by “foreseeable”. It is a word which suggests moderation. It may be that this sense has been transferred to “foreseeable” in the area of negligence. In

that area “foreseeable” is often understood to mean “reasonably foreseeable”. In the present context it operates to exclude the far-fetched and the fanciful.¹⁵

- [20] In the first instance the section must be applied by the site senior executive. It may be assumed that such persons will possess or have access to expertise in relation to the questions of fact which may give rise to the event referred to in the section. Expert opinion may enlarge the range of foreseeable events to include some which might seem fanciful to an untrained mind.
- [21] The section (like most, although not all, of the provisions in the Act and the Regulation) must also be applied in relation to a particular mine. That follows not only from the use of the definite article (“the mine”) but also from the nature of the obligation imposed. This means that reasonable foreseeability must be considered in relation to the particular mine. It is not to be assessed by reference to other mines in Queensland or Australia or other parts of the world. Experience elsewhere may be relevant in assessing what is a reasonably foreseeable event, but only if that experience is relevant to the particular mine.
- [22] In assessing in a particular case whether a hypothetical event is reasonably foreseeable for the purposes of s 296, context is important. Relevant factors may include the physical properties of the mine, the nature of the activities carried on, the nature of things used in or about the mine and the qualities of people involved at the mine. In assessing these factors it must be remembered that things change over time. For example, mines expand and workings are abandoned; procedures are modified; machines and other things wear and deteriorate; and personnel leave and their individual characteristics may change.
- [23] The passage of time is relevant to the assessment of reasonable foreseeability in another respect. It is not possible to assess foreseeability in this context in precise mathematical terms, but it is possible to make statements about relative probabilities. For example if the probability of an event occurring tomorrow is x , then (assuming no material change in the circumstances) the probability that it will occur at some time during a mine life of (say) 30 years is much greater than x .
- [24] The subject matter of s 296 also affects the meaning which should be ascribed to “reasonably foreseeable”. The section is concerned with the ability of persons to escape the mine. It may be assumed that an event affecting the ability of people to escape will be a highly unusual occurrence. Whether this is due to compliance with the other sections of the Regulation or to proper precautionary measures adopted by the mine operator or to something else, or to a combination of these things, does not matter. In terms of probability such an event may always be expected to be most improbable. The reasonable foreseeability postulated by the section will therefore ordinarily be referable to improbable events. That suggests that the mere fact of the improbability of an event, even a statistically high level of improbability, does not exclude its description as reasonably foreseeable.
- [25] An event which affects the ability of persons to escape from an underground mine will often be an event which itself gives rise to the need to escape. A fire in an intake shaft is a case in point. It may be expected that ordinarily there will be a

¹⁵ Compare *Wyong Shire Council v Shirt*, *loc cit*. With the utmost respect to Callinan J I would reject the proposition that such an approach requires everyone to be a Jeremiah: see *Koehler v Cerebos Australia) Ltd* [2005] HCA 15 at para [54].

number of measures in place to prevent the occurrence of such an event. A number of other sections in the Regulation are calculated to have that effect. Even apart from the Regulation, the mine operator may be expected to attempt to prevent such occurrences, if only for commercial reasons. Section 296 was enacted against this background. Consequently it should not be construed in such a way that the existence of other measures tending to reduce (but not eliminate) the likelihood of the occurrence of a relevant event derogates from the obligation which it imposes. The section assumes that there may be a reasonably foreseeable event happening in one escapeway despite the existence of such measures. It is intended to ensure the existence of an escapeway in case those measures fail. It constitutes a belt and braces approach to safety. That approach should not be nullified by a narrow construction of “reasonably foreseeable”.

- [26] It has not been demonstrated that this interpretation should be rejected on the basis that it imposes an unreasonable burden. I respectfully adopt what was written by McMurdo J in relation to such an argument:

“The first stated object of the Act is to protect the safety and health of persons at coal mines or who may be affected by coal mining operations. In the context of this legislative scheme, s 296(1), as the applicant would have it interpreted, would not produce some disproportionately burdensome obligation for the design of an underground mine. It does not seem inappropriate for this scheme to require the escapeways to be separated so that a fire in one escapeway, of which there was some real prospect (although it was very unlikely to occur), would not detrimentally affect the work of the other escapeway. On the other hand, if a reasonably foreseeable event in this context must be something which is more probable than an event having some real chance of occurrence, then those concerned with the compliance with this regulation would have to assess the relative probabilities of a real possibility, and the respondent’s submissions do not reveal where the line would be drawn. In addition, once such an event must be more than a real, as distinct from fanciful, possibility, the operation of this regulation in a particular case could be less demanding than the common law duty of care or that which might be required to yield an acceptable level of risk as that term is explained by s 29 of the Act. Further, the respondent’s case did not attempt to show that, upon the applicant’s interpretation of “reasonably foreseeable event”, the regulation could not be complied with in this case or in any other case, or that compliance would involve some disproportionate cost. Indeed, from the evidence in the applicant’s case, I find that there is no other underground coal mine in Queensland which has but two escapeways constituted by the air intake and air exhaust shafts.”

- [27] In summary, a reasonably foreseeable event for the purposes of s 296 is one which can be envisaged by a person of imagination and intelligence, but which is not far-fetched or fanciful.

The finding of a reasonably foreseeable event

- [28] McMurdo J held that a fire in the intake shaft which could contaminate the exhaust shaft was a reasonably foreseeable event. More specifically, his Honour identified two scenarios involving such a fire and held that each was such an event. On the appeal the CFMEU was content to adopt this approach. The two were selected from the 17 most likely of a group of 65 events identified by Professor Joy in his risk assessment report written after the exercise described above¹⁶. His Honour wrote:

“One of those 17 events was a fire in a load of fuel, as it was lowered down the intake shaft in a container called a fuel pod. Another was a fire at the bottom of the shaft caused by the ignition of a dropped load of fuel. ... Professor Joy wrote of these events and of the ‘acceptability of (their) residual risk’ that ‘the impact of a fuel pod fire in or near a shaft may necessitate a careful risk assessment of the design and use of the pod to derive final design specifications and operational guidelines.’”

Those two scenarios were described by another expert witness, Dr Cliff, as “the worst case scenarios”. Dr Cliff (who was called on behalf of Anglo) was an Associate Professor at the Minerals Industry Safety and Health Centre at the University of Queensland and had over 14 years experience in researching and providing consultation relating to the management of hazards in underground coal mines, particularly spontaneous combustion, mine fires and explosions.

- [29] His Honour made the following findings in relation to the first scenario:

“All bulk fuel is transported to the underground of this mine by fuel pods lowered through the intake shaft. From the evidence of the mine manager, Mr Ryan, it appears that in the further development of this mine, these fuel pods will not be used but the diesel will be transported down a designated bore-hole. ... Still it is plain that the respondent considers that it is unnecessary to change the system for transporting fuel to ensure an appropriate separation of the escapeways. Fuel is transported via these pods approximately twice per week. The transportation of them within the shaft takes less than two minutes. Preparation at the surface involves one person placing the fuel pod into the conveyance on a rail mounted flat topped trailer. The conveyance with the trailer and fuel pod is then lowered to the seam level where it is met and removed by another person who withdraws the trailer and pod. According to Mr Ryan, the pod is closely monitored throughout its journey “and hence a response to an emergency no matter how remote a possibility would be virtually instantaneous”. The pods have two distinct walls so that in the event of damage to the outer wall, the inner wall will remain intact. In the event that the inner wall is damaged, the void between the walls is capable of containing the contents of the pod. There is a fire suppression system which is automatically activated by the fuel reaching a certain temperature in the pod. The capacity of a pod is 2000 litres. The fuel pods are stored underground, no closer than 25 metres from the bottom of the intake shaft.”

¹⁶ Paragraph [16].

He accepted Dr Cliff's evidence that if the fire suppression systems were activated the fire in the fuel pod would be extinguished in a matter of seconds.

[30] His Honour also found:

“The second of his worst case scenarios was that the contents of a fuel pod would spill and would fall into the sump at the bottom of the intake shaft and would burn there. The greater surface area of 2000 litres of fuel within the sump, compared with that fuel within the pod, would result in the fuel completely combusting in 21 minutes, according to Dr Cliff. However, there is a pump in the sump which if it operates, would remove some of the fuel resulting in a fire in the sump taking no longer than 10 minutes. Even then, this assumes that action is not taken to suppress the fire as well as that there is some source of ignition in close proximity to the sump. He says, and I accept, that such a fire in the sump could create a plume of smoke sufficient to restrict visibility to less than his 10 metre threshold.”

[31] He held that in either case the events could occur only through a combination of several human and/or mechanical failures. Such a coincidence of faults or failures was described by Dr Cliff as the “Swiss cheese model”, used for catastrophic events, in which

“We do allow for individual slices to line up, but I think in the case of the fuel pod, a significant number of slices would have to fail, so that’s why we regard the probability as being low.”

His Honour accepted that instructions were in place which were designed to eliminate any ignition sources from the intake shaft during the time a fuel pod was being transported. He continued:

“Mr Ryan’s evidence as to the instructions given to personnel in relation to welding and contraband items indicates the perception of the mine’s management that at least, absent appropriate procedures and directions, there is a real risk that events such as these could occur. The respondent has itself identified the real possibility of, for example, an accidental fire from the burning of the fuel being conveyed through the intake shaft, and accordingly it has put in place apparently extensive mechanisms and procedures in order to avoid such an occurrence. The event remains a real possibility unless those mechanisms and procedures could be regarded as incapable of failure through human error. Those various mechanisms and procedures might represent a response to a foreseeable risk which the common law would regard as sufficient to discharge a duty of care. But the present factual question is whether they are such as to put paid to any real chance of the event occurring. In my view they do not, and whilst the prospects of the occurrence of either of these “worst case” scenarios might be extremely small, it remains the case that through a combination of human errors, there is some real chance of their occurrence.”

That conclusion is challenged in this appeal; there is no challenge to his Honour’s findings of primary fact.

- [32] At the core of that challenge was Mr Fraser's submission that no particular mechanical or human error or mechanism capable of leading to rupture of either skin of the fuel pods was put to Anglo's witnesses or adduced in evidence. Consequently the CFMEU failed to prove that either of the worst case scenarios was reasonably foreseeable. Mere assertion that unspecified mechanical and human errors might coincide and combine to produce the worst case scenarios in some unspecified way was, he submitted, speculation, not evidence capable of fulfilling the CFMEU's onus of proving breach of the Regulation. In a careful review of the evidence Mr Fraser demonstrated the absence of evidence showing precisely how a pod was likely to rupture. There was in fact very little evidence about the construction of the pods. They had been built in accordance with guidelines of the New South Wales Mines Department and were fitted with an automatic fire suppression system. Their strength, brittleness and flexibility were not addressed; the specification for their construction was not put in evidence; and the evidence did not disclose what they were made of. In those circumstances the CFMEU did not, it was submitted, satisfy the onus upon it.
- [33] If the CFMEU was required to prove a precise mechanism by which it was reasonably foreseeable that a fuel pod might rupture, this appeal must succeed. No precise mechanism was proved. However on the interpretation of s 296 advanced above, the CFMEU was not required to undertake that task. It sought to prove only that the two scenarios were reasonably foreseeable. They were the events which it proposed would affect the ability of persons to escape. A variety of mechanisms of greater or lesser probability could lead to fuel becoming available for a fire. The CFMEU was not required to prove that each one was reasonably foreseeable. The probability that there will be some fuel available is the sum of the probabilities of each of the possible mechanisms by which it might become available. The section does not require an examination of the foreseeability of each individual mechanism.
- [34] There was evidence that in the absence of appropriate precautions the two scenarios were possible. Professor Joy and his team (which included Mr Ryan) identified 12 "intermediate events" as they described them, which could result in the two scenarios, absent precautions. He recommended, "The impact of a fuel pod fire in or near a shaft may necessitate a careful risk assessment of the design and use of the pod to derive final design specifications and operational guidelines." Mr Ryan's response to that recommendation was, "The fuel pod will only continue to be in use in the shaft until approximately June 2004. It has been designed to Department Guidelines (Number MDG36) and is fitted with an automatic fire suppression system. In June 2004, all diesel fuel will be transported via a dedicated borehole, not in the shaft. This will eliminate the risk of a fuel pod fire in the shaft." It may be inferred that no risk assessment of the design of the pod was undertaken.
- [35] A Safety Health and Management System Procedure was developed and embodied in a document which formed part of the Safety Health and Management System of the mine. So far as is relevant, it provided:
- "4.2 The mobile fuel pod will be transported in the materials cage during period of stores transfer from surface to seam. At no time will bulk fuel be transported during shift changes. Man riding will be restricted when Bulk Fuel is being transported in the conveyance. (Pod to be delivered Underground during maintenance window as per risk assessment).

The bulk fuel pod will be loaded into the conveyance using the surface forklift for despatch to seam level. The bulk fuel pod will be unloaded at seam level using a LHD. The fuel pod will be stored in a designated area and clearly sign posted for traffic areas i.e. Fuel Pod.

No person shall operate any machinery in vicinity of the conveyance for the purpose of loading or unloading other than a person appointed by the Underground Mine Manager, in writing, to do so, or a person learning to drive the machine under instruction from an appointed trainer, or tester. The minimum standard for training and assessing must meet the requirements of the Black Coal Competencies.

...

- 5.1 Underground Mine Manager shall ensure that all of the provisions of this SOP are implemented and that compliance is achieved.

...

- 5.3 [All Employees] will make themselves, fully conversant with this Procedure and adhere to the rules stated.”¹⁷

The potential for failure due to human error or mechanical failure is self evident.

[36] It is I think significant that Anglo did not ask Professor Joy to carry out a risk assessment of the mine with what it asserted were appropriate precautions in place. Had he done so he might have taken into account a Mine Record Entry dated 31 January 2003 written by a Queensland Government Inspector of Mines. That related to “the high potential incident” that occurred on 24 January. While a bobcat was “mucking out” material at the pit bottom of the number two shaft, sparks were noticed coming from under the scrubber tank at the rear of the vehicle. Two possible causes were identified: previously undetected collapsed bearings in the fan belt tension device (human error plus mechanical failure) and the water line to the scrubber tank being turned off (human error). On that occasion there was no fire; the material being mucked out did not catch and no methane was detected in the area. On another day the result might have been different. As Mr Ryan conceded in cross-examination, human error had happened in the past and he did not doubt it would happen again in the future. McMurdo J’s conclusion that there was a real as distinct from a fanciful chance of each scenario occurring was correct.

[37] On the construction of the section which I have advanced above, the proper conclusion on that evidence is that the two scenarios referred to by his Honour were reasonably foreseeable. That was the conclusion which his Honour reached, albeit upon a slightly different construction of the section.

[38] I have approached the issue on the basis that the two scenarios constitute relevant events for the purpose of s 296 because that was the approach adopted by the parties. I should not be taken as endorsing that approach. It may well be that in the

¹⁷ Grasstree Safety Health and Management System document GSHMS 010, “Safe Transport Underground of Fuel Containers”.

context of the present case the relevant event should have been identified simply as a fire in the intake shaft. That is what is said to affect the ability of persons to escape. Having regard to my conclusions above it is unnecessary to carry this analysis any further.

The ability to escape point

- [39] McMurdo J's findings are summarised above.¹⁸ His Honour drew attention to the difficulty which use of the escape equipment would cause not only in the exhaust shaft but also within all or much of the roadway leading to it. It was true, as his Honour pointed out, that the CFMEU relied upon the difficulty in both areas. It was however enough for it to demonstrate a direct effect on the ability of persons to escape through the shaft. Mr Fraser submitted that the CFMEU's evidence referred only to the effect on persons travelling through roadways whilst wearing protective equipment (as opposed to through the escapeway constituted by the exhaust shaft). That submission is not correct. Mr Vaccaneo, an Industry Safety and Health Representative appointed under the Act and having 22 years experience in the industry, gave evidence which demonstrated that with only one air intake, a fire in that intake would contaminate "every drive and roadway in the mine. This is inclusive of the escapeways. That is, a mine worker's ability to use all escapeways is affected." He specifically deposed that a fire in the intake shaft would contaminate all the intake roadways "and the return". His Honour summarised Mr Vaccaneo's evidence this way:

"He said, and I accept, that underground mine workers are instructed to use their self-rescuers 'at the first sign of smoke or by being instructed by their statutory officials in case they are picking up elevated levels of carbon monoxide rather than just smoke'. So the use of this equipment does not depend upon the existence of a dangerous level of smoke or risk from oxygen deprivation or carbon monoxide. The equipment is used whilst there is any risk through the prospect of contamination of the air. He also says, and I accept, that if and when the person reaches air which he knows, or can be told, is uncontaminated air, the person is able to then safely remove the protective goggles and breathing equipment.

[17] According to Mr Vaccaneo then, at least in some circumstances the ability to escape from an underground mine such as this one could be affected by whether the air is contaminated throughout the mine and the escapeway, so that the protective equipment must be worn throughout the escape, compared with the protective equipment not having to be used at all, or only for some of the escape."

Mr Fraser did not challenge any of these findings. In addition, Mr Ryan exhibited to his affidavit a copy of Anglo's document entitled "Emergency Egress for Production Winder (Mode 2B)".¹⁹ The Production Winder was the lift in the exhaust shaft. The impact which impaired visibility and an inability to communicate would have on using that lift in an emergency is obvious from the document. There was therefore abundant evidence to support the finding that the

¹⁸ Paragraph [6].

¹⁹ Grasstree Standard Work Procedure GSWP 072.

hypothetical fire would directly affect the ability of persons to escape through the exhaust shaft. That finding was correct.

- [40] Even if the evidence had disclosed that only the adjacent roadways would be contaminated by a fire in the intake shaft, the requirements of this part of s 296 would have been satisfied. There is no semantic difficulty in the notion that a person's ability to escape through the exhaust shaft is affected if his or her ability to use the roadways adjacent to the shaft is affected. Unfortunately this aspect of the case became a little confused at first instance. Anglo there argued that if contamination of roadways were taken into account, compliance with the section would be impossible, because even with a second intake shaft some roadways (those abutting the shaft with the fire) would always be contaminated. Consequently there was no step which the site senior executive could take to avoid a breach of the section. Therefore, it was submitted, roadways could not be taken into account. McMurdo J dealt with this argument by interpreting "the ability of persons to escape through the other escapeway" to mean the utility of the other escapeway. On appeal that interpretation was challenged. It is unnecessary to resolve that challenge. The problem of the impossibility of compliance does not arise. While it is true that a fire in the intake shaft would lead to contamination of the roadways adjacent to that shaft, it would not lead to contamination of the roadways adjacent to a second intake shaft. That was clearly demonstrated by Mr Vaccaneo's analysis of the differences in air flows according to which of the two designs was employed, the correctness of which was unchallenged. Atmospheric separation would be achieved. The ability of persons to escape through a second intake shaft would be unaffected by contamination of the roadways adjacent to it. The problem postulated on behalf of Anglo does not arise.
- [41] The CFMEU proved its case. The appeal should be dismissed with costs.
- [42] **MULLINS J:** I agree that the appeal should be dismissed with costs for the reasons given by Fryberg J.