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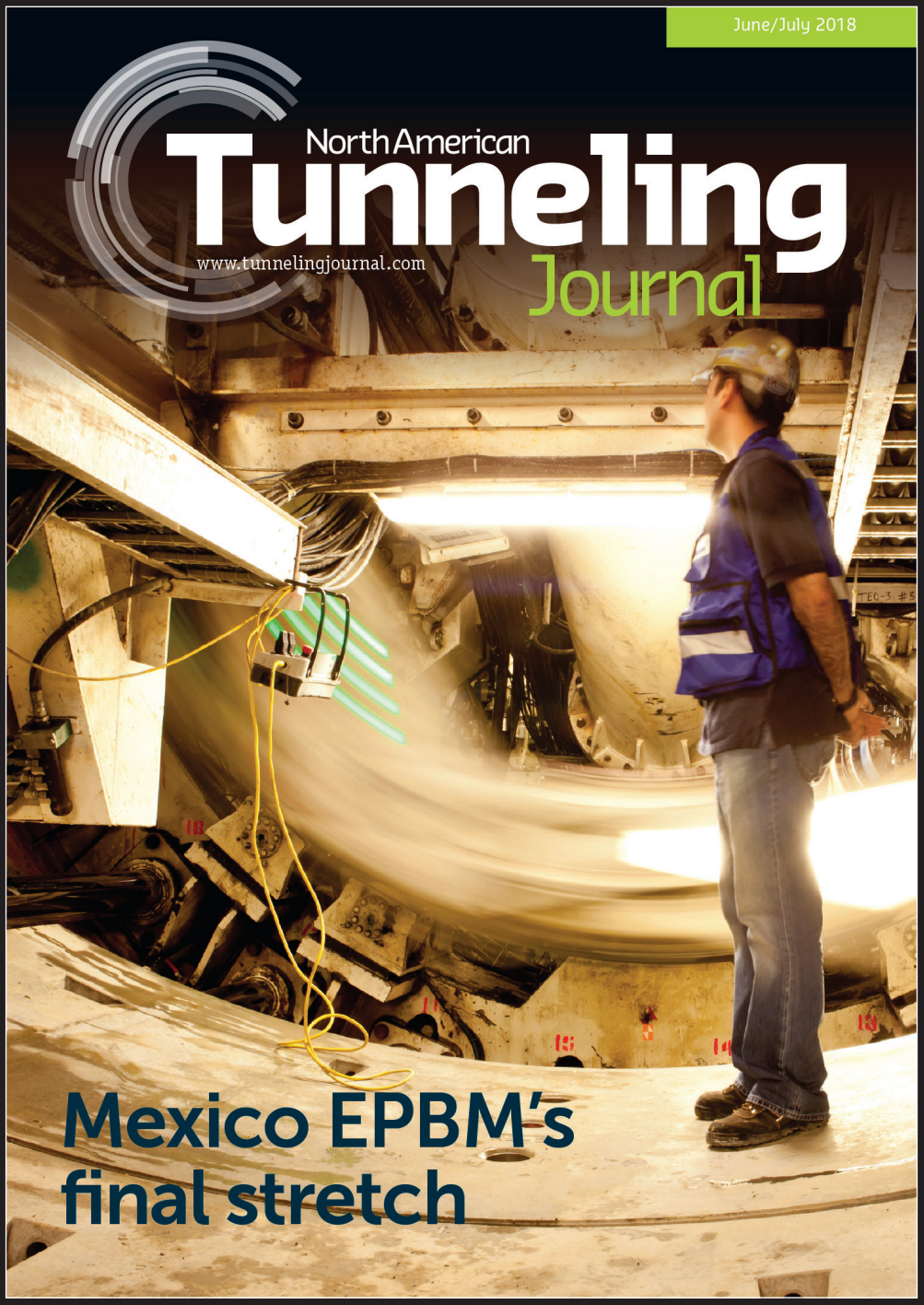

Mexico EPBM's final stretch

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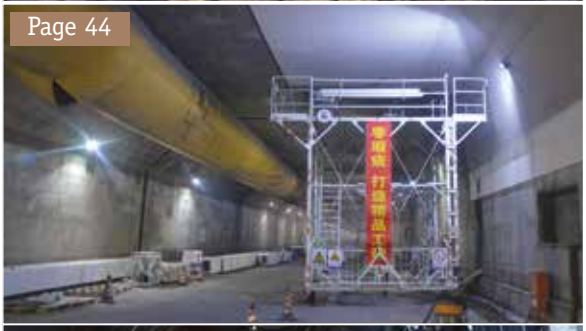
The changing face of hyperbarics



Contents

Cover Caption – Hyperbaric saturation diving in action, not a job for the faint hearted (photo supplied by Claus Mayer of Nordseetaucher)

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Glendoe Hydro Collapse Case on Appeal

By Professor Arnold Dix, Lawyer and Scientist, and CEO of the ALARP group of companies

The Glendoe hydro tunnel collapse legal saga has more twists, bends and curves than the Loch Ness Monster herself. The most recent twist comes from the findings of three Appeal Judges whom have reconsidered the 73,000 pages of evidence, hundreds of hours of testimony and complex legal argument in this epic "monster" of a case.

On Appeal from a single commercial Judge, three Judges of the First Division Inner House Court of Sessions in the United Kingdom delivered their Judgement on Appeal in the matter of the Glendoe Case, 10 April 2018.

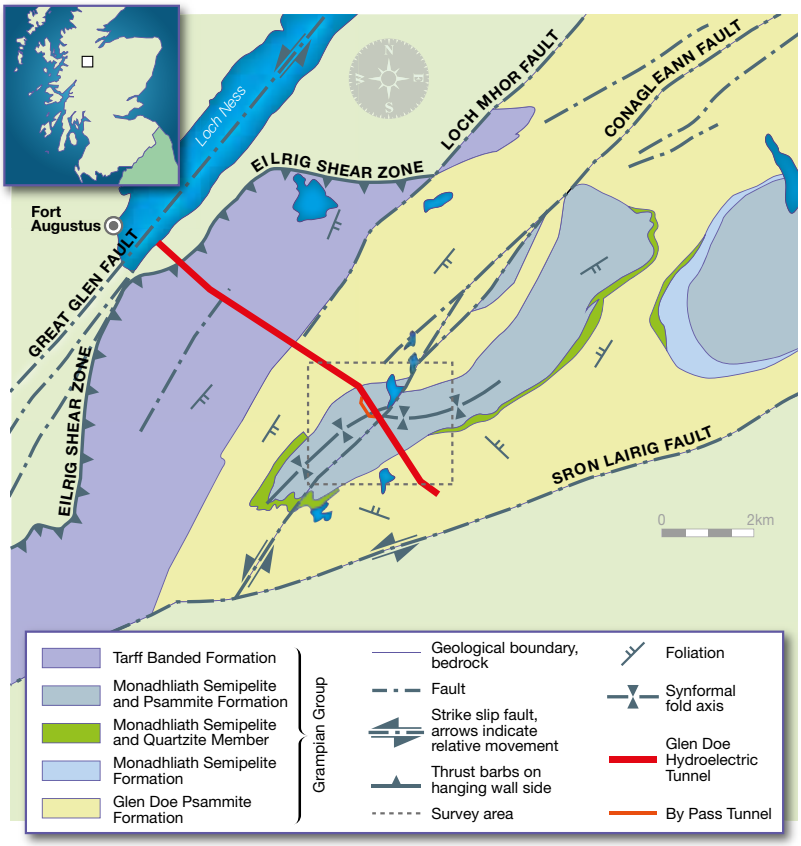
On Appeal the Court has found that the Contractor when delivering a piece of hydro electricity infrastructure with a contracted design life of 75 years does not meet the Clients' requirements if the tunnels collapses within 4 months.

The Appeal Court has also found that the Contractors did not demonstrate they appropriately managed the operational collapse risks associated with a known and widely discussed fault zone (where the collapse actually occurred) and indeed were highly critical of the fact that, not only weren't the risks of erosion and collapse adequately dealt with, but the key experts that could have been called to provide an insight into what actually occurred during construction were not called to give evidence.

In the end the Appeal Court was unimpressed that the Contractor refused to make good the collapse until payment terms were agreed, instead of actually performing the urgent remedial works and determining who should pay later.

If you ever needed to be reminded why it is good to settle a Court case, this is the case for you. The enormous Appeal Judgement reads like a "whos who" of tunnelling – with a large number of the worlds top experts and companies named. If you were ever in any doubt about the branding reasons to resolve Court cases privately, this is the case to remind you why.

Plan map of the project location and geology



Background

Readers will recall, from the earlier description of the case in the Tunnelling Journal April/May 2017, a major dispute arose about whether the collapse of the tunnel was as a result of a defect in the design or construction. The legal questions surrounded the standard form NEC Construction Contract (Second Edition) and, whether or not, Clause M could convert a design and build fit for purpose contract into a contract in which the obligation upon the contractor was reduced to merely using reasonable skill and care in the design aspects of the work.

Not long after the completion of the tunnel there was a major collapse in the vicinity of a well known fault zone (the 'CFZ'). The collapse effectively rendered the power station useless.

The contractor refused to make good the collapse until commercial terms were agreed, the client suggested a commercial compromise that was rejected by the contractor. The client then remediated the works with new contractors. The Court found that the client was within their rights to do so – despite the protests from the contractor about the cost and nature of the repairs.

As a result of the collapse, a bypass tunnel of some 605m was constructed at a price of around £137M.

The Court's Logic

The Court was particularly impressed with the stated general contractual requirement of:

'...creation of a tunnel with a 75 year design life.'

Given the 75 year design life of the tunnel, the Appeal Court was of the view that the design and Works Information should collectively result in a long lasting tunnel and that if it was not long lasting, it would constitute a defect in terms of the Contract and would constitute a failure to provide the works in terms of the Works Information.

This meant that the collapse had a very fundamental impact on the thinking of the Court of Appeal. Practically, the Court of Appeal noted that given the actual state of the rock, the HRT could not have survived for 75 years, or even one year, in the condition which in fact existed.

'The question is then whether the HRT can be said to be disconfirmed from the Works Information i.e. [i.e. the design life] by virtue of its 'very' early occurrence. The evidence, be on the occurrence of the collapse, does not support a contention that what was designed was not capable of lasting the required 75 years. On the contrary, once the parties had agreed upon an unlined tunnel, the general consensus of the experts and others was that the process that was accepted was appropriate.'

The general dissatisfaction of the Judges on Appeal are reflected in the opinion of Lord Menzies. Lord Menzies notes:

'…where a contract provides that the principal components of a scheme will provide reliable service and that requirement for major refurbishment or capital expenditure for 75 years, and one of those components suffers a catastrophic collapse within about 4 months of takeover requiring significant capital expenditure, the application of the principles of Contractual interpretation may result in the same answer as might be given in the real world'.

'…it was abundantly clear that the HRT did not have a design life of 75 years, as it had already suffered a catastrophic collapse'.

Furthermore, the Judges on Appeal in sifting through some 73,000 documents and having considered the expert testimony of at least hundreds and if not thousands of hours of evidence, found two matters of particular interest. Firstly, they discovered that one of the hazards identified was 'erosion' of erodible rock in the context of a hydro electricity scheme operation (not merely tunnel stability) and secondly, they collectively drew an adverse inference against the contractor for failing to call key witnesses.

With respect to the first limb, Lord Menzies notes:

'One of the hazards identified in Table 11 for the HRT was 'erosion' of erodible rock during operations. The Table assessed the level of risk before and after mitigation measures. This hazard was assessed as having a risk rating of 9 and to be a high risk before mitigation measures. The counter measures specified to deal with this hazard were 'application of shotcrete if not already covered/'protected' by steel ribbed support. The risk after the special countermeasures have been implemented was reduced to 3, and was assessed as being low, this was the relevant part of the Contractors design which was approved by the Project Manager in that it obliged the Contractor to apply shotcrete to erodible rock if it were not already covered or protected by steel ribbed support. The Contractor did not fulfil this obligation'.

Indeed, the Appeal Court noted that the earlier Judge overlooked the evidence that the 'TBM crew and others may not have appreciated what they were looking at' because the question of erodibility was not included in the matters that they were directed to review. Indeed, the Appeal Court found that:

'The operational imperatives of running a hydro scheme with the high water pressures and flows and pressure variations was something that should have been considered in the context of the Table 11 erodibility and not just the support. As the Court notes the RSM considered rock stability during excavation. It did not consider stability in conditions of hydraulic load. That is why [the designer's engineers] had returned to inspect the tunnel and consider erosion. In the absence of evidence that Table 11 [and erosion issues] and the erosion in the invert had been considered properly, negligence was established [against the Contractor]'.

In fact, the Appeal Court went to great lengths to describe the various locations including one area described as 'big, bad zone', where multiple sheers had been noted as well as report indicating that shotcrete be applied to erodible zones independent of the rock classification.

The Appeal Court was also critical of the earlier Court for failing to reference the Defects Notice that recorded significant voids below the tunnel invert where weak or sheered rocks had been eroded. Indeed, the Court of Appeal was of the view that the earlier Court simply did not understand the importance of all of the information on ground conditions which had been collected and the fact that as the Court of Appeal noted: 'there was a prima facie case based on a combination of the mapping and REC Sheets that Class 4 supports should have been installed'.

Key Witnesses Not Called

The Appeal Court was also unimpressed that many key witnesses had not given evidence.

'Key Geologists, supervisors, indeed 'none of those who had taken any of the decisions on level of support had been called'.

The Court noted:

'Instead a number of experts had been asked to look at the documents with a view to telling the Court what their authors had seen, thought or done.'

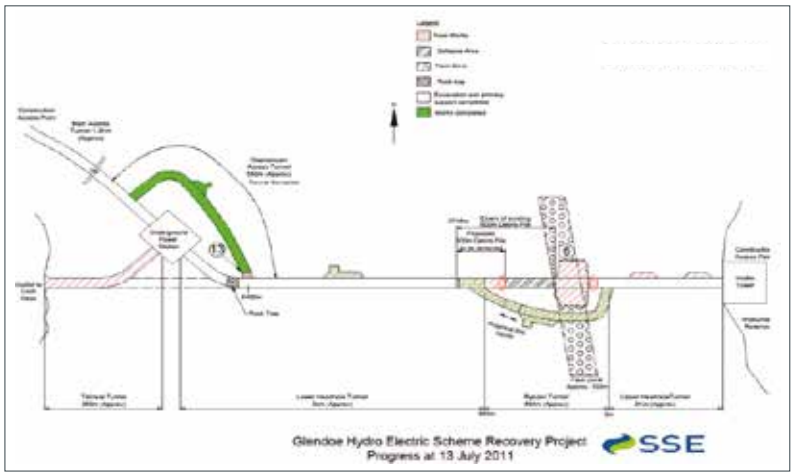
The Appeal Court also felt that the original Commercial Judge made significant errors of fact. The Appeal Court noted that:

'Experienced tunnellers had seen signs of fault that might have threatened stability even though the original Judge had said that this was not the case'.

In fact, the Appeal Court went to great lengths to describe the various locations including one area described as 'big, bad zone', where multiple sheers had been noted as well as a report indicating that shotcrete be applied to erodible zones independent of the rock classification.

For the Appeal Court it was very important to understand what the Owner had purchased. An analysis of the Appeal decision reveals the Appeal Court was very clear about what was purchased.

Plan of the repair works



The Importance of the Field Work and Methodology

In this case the Court held that there were three relevant elements to the works information. The Court of Appeal found the three most important elements of this were that the hydro scheme be 'designed and constructed', it would provide inter alia reliable services without the requirement for major refurbishment or significant capital expenditure within the design life of the scheme, that the Contractor was responsible for the design of all of the works. And that in the design brief there was a requirement of 'guaranteed performance' and a 'design life' of 75 years.

By identifying the design life of 75 years the Appellant Court could then place the conduct of the parties into this broad overarching requirement. The method by which the contractor ensured that the outcome was a 75 year guaranteed performance was through the field methodology. It was noted with approval that under the contract the following was required:

'Following each excavation cycle the Contractor maps the face, crown and side walls, to enable the classification of the ground in accordance with the rock mass classification system. The Contractor agrees the rock mass parameters with the Project Manager and the support class is agreed prior to its installation…'

The Court noted that it was anticipated that shotcrete would be required to over 90% of the HRT and a lining comprising 150mm of shotcrete was contemplated to be required over the whole tunnel with a concrete insert to the remaining 10%. An alternative solution was proposed using the TBM and it was represented to the Client that the alternative method would not compromise the service life of the tunnel.

The Court of Appeal were also clearly impressed in the documentation about anticipated ground conditions in the CFZ and even under the revised proposed HRT rock support methodology it was noted:

'Erodible zones will have to be shotcreted regardless of the associated rock classing'.

As part of the design there is a document called the HRT Rock Support Methodology (RSM). In this documentation there is reference to: 'erodible zones will have to be shotcreted irrespective of the associated rock class'. The Court of Appeal noted with interest that:

'Sometime after the commencement of the excavation, the [Contractor's] Geologist was asked what was meant by 'erodible'. But no reply was forthcoming'.

Indeed, the Court of Appeal noted that within the RSM there was a table which was described as, 'Geotechnical risk assessment after excavation' and that it contained a reference to the hazard of, 'erosion of erodible rock during operation'.

The Court of Appeal seemed quite focused on the fact that operation meant the period during which water would flow through the tunnel under high pressure. At the turbine the pressure would be 60 bar, although only about 20 bar at the CFZ. The hazard involved a 'high' risk requiring counter measures in the form of the, 'application of shotcrete if not already covered/protected by steel rib support'.

Failure to Call Witnesses

In the adversarial system of law parties are obliged to either call key witnesses or provide an explanation as to why a key witness is not called. An explanation as to why a key witness is not called is, for example, 'that they are dead'.

However, in this case each of their Honours noted that a key question was the actual state of rock and this was critical because the tunnel had to survive for 75 years as part of a hydro scheme. As noted:

'One curious feature… of this case is that what might have been otherwise regarded as crucial testimony on the issue of negligence, notably but not exclusively that of [the Contractor's Field Geologist] was not adduced … there was no material produced that [the Geologist] could not be found and duly cited to appear in Court. It must be assumed that the decision of [the Contractors] not to call him was a deliberate one…'

…'When an incident occurs, and the onus is on the party upon the onus lies does not lead his protagonist, there can be no doubt that the Court can draw an inference from that absence. The Court would be entitled to find that the matter upon which the person was peculiarly able to speak, in this case the exercise of due skill and care in the HRT, had not been proved. The Court could thereby hold that the other parties case was thus made out. … In this context there is considerable force in the [Client's] submission that the absence of [the Geologist] the Geologists [and the other geologists associated with the Contractor] ought to have been fatal to the [Contractors] case.'

'the Defendants [Contractors] had not discharged the onus on them, in terms of the Contract, to prove the use of reasonable skill and care, especially given their failure to produce testimony from the Leading Engineering Geologist … who had made the crucial decisions on tunnel support in situ following excavation'.

NEC Construction Contract Clause M

There was some considerable legal debate in the first commercial case and the subsequent Court of Appeal case about the effect of the NEC Construction Contract and in particular the impact (or otherwise) of 'Clause M'.

Clause M is the optional provision which is to convert the Contractors liability for occurrences which are his risk from one of strict liability to one which is qualified by reference to a test of reasonable skill and care.

On Appeal the Judges considered that the collapse of the tunnel was due to defects which existed at takeover and that they were not due to the Contractors design of the works but rather to the implementation of that design. On Appeal the Court [Lord Glenny] found:

'In those circumstances Option M is not engaged and an offence of using reasonable skill and care to ensure the design complied with the Works Information is not available to the Contractors. It follows, …. that the collapse of the tunnel was a Contractors risk in terms of [the Contract] and the [Contractor] are obliged and liable to the [Client Owner] for the cost of repairing the tunnel'.

Under the NEC Contract Option M provides that:

'The Contractor is not liable for defects in the works due to his design so far as he proves that he used reasonable skill and care to ensure that it complied with the works information'.

It is also noted that in a Defects Notice served upon the Contractors:

'A joint inspection of the [HRT] … has identified areas where the rock support is not in accordance with the agreed rock class and the support is considered to be inadequate to ensure the long term stability of the rock. It is therefore not in accordance with the Contractor's design which has been accepted by the Project Manager'.

The Appeal Court noted that a number of items were said to require attention and additional support measures particularly shotcreting and extra bolting in significant number of locations.

The Appeal Court also noted in a Defect Notice issued after joint pre-watering inspections noted that:

'Significant voids were evident below the tunnel invert at several locations where weak and/or sheared rock had been eroded by cascading water flushing exercise carried out to clean the tunnel invert'.

The Appeals Court further noted that subsequently there was another Defects Notice again listing numerous areas of outstanding works including filling, 'with concrete pits and voids in tunnel invert'.

Decision

On Appeal the Court awarded £26,963,845 and 56 pence being the repair costs less amounts for inefficient working.

It is important to note that shotcrete alone would have not been enough to stop the collapse. The Appeal Court unlike the earlier Court realised that the only way to stop the collapse would have been Class 4 support and in fact Class 4 support had not been used anywhere in the tunnel in any case.

At the heart of this case is that there was not the connection between the constructability of the tunnel as a tunnel, and, the constructability of the tunnel as a serviceable hydro headrace tunnel.

A review of the Court of Appeal's decision suggests very strongly that the Judge was impressed by the fact that:

'a significant feature of the engineering of the HRT [head race tunnel] was that it was built through the Conagleann fault zone [CFZ] at a depth of some 260 metres. ….. it is at an area in which rock conditions for tunnelling could be anticipated to be difficult'

undergoing somewhere between 60 and 20 bars of variable water pressure along with the mechanical values of the movement of the water.

The Appeal Court found that the earlier Court should have concluded that 'the Contractors' had placed unlawful preconditions on the [clients] for the repair of the tunnel. The Court found that while the clients had wanted the works carried out as quickly as possible in order to mitigate their loss of profit the contractor was attempting to impose an ultimatum for the remedial works which was wrong.

Ultimately the Appeal Court concluded that ['where 'the Contractor'] failed to repair defects the employer was entitled to recover the costs. The position was different in relation to loss and damage. The responsibility for them depend upon whether the risk was that of the employer or of the Contractor? The distinction between defects and loss and damage had a Contractors rationale. The contractor was responsible for carrying out the works so that it was free from defects. The contractor was therefore, subject to the provisions of Option M, responsible for repairing them at his own costs. The position was different in relation to loss and damage which was fortuitist and could be insured against.

Discussion

Court, unlike science and engineering, is about bringing finality to a dispute. The rules of engagement can differ from jurisdiction to jurisdiction and even the grounds of running a court case and subsequently appealing the decision of the earlier court case can differ, but in the end, it is about letting a stranger (the Court) make a decision for parties that cannot agree.

An adversarial legal system is not, and nor is it intended to be, the place where each party to a proceedings is compelled to share everything they know about their case. It is the role of the lawyers to put the clients positions as strongly as possible so as to persuade the Judge. This adversarial approach means that there are always complex tactics employed to ensure a clients' best interests are put forward. This is what lawyers do, this is what lawyers are meant to do, this is how the system works.

The process of Appeal allows the parties to a legal proceeding to air their dissatisfaction to a decision based upon a range of narrow legal grounds. Typically appeals are made because a Judge or Judges are claimed to have made an error. An error of the Court is viewed very seriously because it undermines the administration of justice.

In this case, an Appeal was lodged (and was successful). Practically speaking the appeal judges have decided the earlier judge was wrong – and the builder failed to deliver a 75 year design life hydro project. Furthermore the appeal judges were critical of the builders refusal to unconditionally wright the collapse.

This decision can also be appealed. Let's see if the Glendoe legal monster has another sighting at Loch Ness on a third hearing of this saga. Brown water seen entering Loch Ness from the HRT – brown water Indeed.