



FIRST DIVISION, INNER HOUSE, COURT OF SESSION

**[2018] CSIH 26
CA162/12**

Lord President
Lord Menzies
Lord Glennie

**OPINION OF LORD CARLOWAY,
the LORD PRESIDENT**

in the reclaiming motion of

SSE GENERATION LTD

Pursuers and Reclaimers

against

HOCHTIEF SOLUTIONS AG AND ANOTHER

Defenders and Respondents

**Pursuers and Reclaimers: Moynihan QC, Barne QC; CMS Cameron McKenna Nabarro Olswang
LLP**

Defenders and Respondents: McBrearty QC, Richardson QC; Clyde & Co.

10 April 2018

Introduction

[1] This is an action of damages arising out of the collapse of a tunnel designed and constructed as part of a hydro-electric scheme by the defenders for the pursuers at Glendoe, Fort Augustus, between 2006 and 2008. At a basic level, the case is simply about which party should bear the cost of repair; the employer who instructed the work or the contractor who designed and built the tunnel. However, the litigation has proceeded along more intricate lines. A major dispute has arisen about whether the collapse was as a result of a

defect in the design or construction. If it was, a further question is whether the selection of an optional clause (M) in the standard form NEC Engineering and Construction Contract (2nd ed), effectively converted what would otherwise be a contract requiring the contractor to design and build something which was fit for its purpose into one which obliged the contractor only to use reasonable skill and care in the design aspects of the work.

[2] The head race part of the tunnel (HRT) ran for a distance of 6.2kms from a reservoir formed at the head of Glen Tarff, some 600 metres above the turbine. The tailrace tunnel (TRT) is a further 1.9kms in length and discharges the water from the reservoir into Loch Ness on its south eastern shore. A significant feature of the engineering of the HRT was that it is built through the Conagleann Fault Zone (CFZ) at a depth of some 260m. The CFZ is a tear in the ground caused by an ancient earthquake. It is an area in which rock conditions for tunnelling could be anticipated to be difficult.

[3] In about April 2009, not long after the completion of the tunnel, there was a major collapse in the vicinity of the CFZ, about 2kms from the reservoir. This caused a complete blockage over a distance of some 70m, with debris sloping down towards the turbine for a further 600m. After considerable, and latterly cool, communings between the parties, the defenders declined to carry out remedial works without being paid. The pursuers instructed the Royal BAM group to construct a 605m bypass tunnel and associated works. This ultimately cost about £137 million; a sum not far removed from the original contract's £126 million price estimate.

[4] There was a preliminary issue, which was resolved at a debate, on whether the claim was relevant, standing the existence of, or a contractual provision for, a joint insurance policy in respect of contractor's risks (being risks other than those of the employer (*infra*)). The commercial judge held ([2015] CSOH 92) that the claim was relevant notwithstanding

the existence of the insurance. He did so without the advantage of the various Opinions in the UK Supreme Court in *Gard Marine & Energy v China National Chartering Co* (the “*Ocean Victory*”) [2017] 1 WLR 1793. This issue is the subject of a cross appeal and will be revisited with the benefit of that judgment.

[5] Much of the argument in the principal appeal centred upon the proper construction of the contract; notably whether the collapse was a contractor’s risk. Such a risk included loss or damage to the works which was due to “a defect which existed at take over”. Central to that issue was whether the commercial judge was correct in his analysis of what constituted a defect. He held ([2016] CSOH 177) that no defect existed, partly on the basis that the defenders escaped liability because of the terms of Option M. These excluded liability for defects due to the contractor’s design if he proved that he used reasonable skill and care to ensure that his design complied with the “works information”.

[6] The pursuers contended that the contract provided that the defenders were obliged to correct any defect, no matter what its cause might have been, at least up until the expiry of the defects correction period, which occurred some two years after take over. The design, it was said, had not complied with the works information, which, it was argued, specified a tunnel with a design life of 75 years. The defenders had, in addition, not complied with part of the design; notably a requirement to counteract the potential for the “erosion of erodible rock” and to install support commensurate with specific classes of rock. The defenders 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 adduce testimony from their leading engineering geologist, namely David Taylor, who had made the crucial decisions on tunnel support *in situ* following excavation.

[7] The defenders adopted the reasoning of the commercial judge on his interpretation of the contract and the discharge of the onus of proof. Although it had been accepted at the proof that, as a generality, the defenders were liable to correct defects, the pursuers had not demonstrated that a defect in the design had ever existed. At the centre of this argument was the contention, which the judge accepted, that the design involved a holistic joint process whereby the parties agreed the condition of the rock, and the measures required to ensure adequate support for the tunnel, at the time of excavation and thereafter during a series of pre-watering up inspections.

[8] The reclaiming motion raised a number of subsidiary issues, including whether the commercial judge's reasoning was adequate and whether he could consider, and attach significant weight to, documents (including reports), which had not been spoken to by their authors. The judge's award of almost all of the expenses, including those of an 84 day proof, also came under challenge.

[9] The defenders cross appealed not only on the insurance issue, but also on the commercial judge's failure to award damages for the pursuers' breach of contract in not allowing them to carry out the remedial works. They contended that the judge erred: (i) in awarding the pursuers damages on account of the scheme not being operable following the collapse (low availability damages); (ii) in requiring the defenders to repay monies awarded upon Adjudication; and (iii) in his assessment of *quantum* of hypothetical damages, had the pursuers been successful in their principal case.

The contract

The core clauses

[10] Critical to the resolution of the litigation is a proper understanding of the structure of

the contract. In order to describe this, it is necessary to quote substantial parts of both the contract and the associated works information and design documents. In terms of Schedule Part 1 (Contract Data Part One), the contract's conditions included the core clauses and *inter alia* Option M of the standard form NEC Engineering and Construction Contract (2nd ed) (reprint May 1998)¹. The "works" were defined as those described in the "works information" and all the documents incorporated in the contract's Schedule Part 3. Under the heading "2. Contractor's Main Responsibilities" it was provided that:

"The contractor's liability for defects due to his design that are not listed on the defects certificate is limited so far as he proves he used reasonable skill and care to ensure it complied with the works information".

[11] The completion date was initially set at 28 February 2009. The defects date was 104 weeks after completion. Notwithstanding that the limitation on liability for defects under heading 2 applied only to those not included on the defects certificate, which was to be issued before the defects date, the broader terms of Option M were then set out. These are that the contractor was, apparently as a generality:

"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".

[12] The Core Clauses, which were in 9 parts, included the following:

"1. **General ...**

Identified and defined terms 11

11.2 ... (4) To provide the works means to do the work necessary to complete the works in accordance with this contract ...

(5) Works information is information which ...

- specifies and describes the works ...

and is

¹ Some of the words in the contract and the works information (*infra*) were capitalised or italicised. This formatting has been removed to ease reading.

- in the documents which the contract data states it is in ...

(13) Completion is when the contractor has

- done all the work which the works information states he is to do by the completion date and
- corrected notified defects which would have prevented the employer from using the works

(15) A defect is

- a part of the works which is not in accordance with the works information or
- a part of the works designed by the contractor which is not in accordance with ...

the contractor's design which has been accepted by the project manager.

(16) The defects certificate is either a list of defects ... notified before the defects date which the contractor has not corrected or ... a statement that there are none.

...

The project manager and the supervisor 14

14.1 The project manager's or the supervisor's acceptance of a communication from the contractor or of his work does not change the contractor's responsibility to provide the works or his liability for his design.

...

2. The Contractor's main responsibilities

Providing the Works 20

20.1 The contractor provides the works in accordance with the works information.

The Contractor's design 21

...

21.2 The contractor submits the particulars of his design as the works information requires to the project manager for acceptance. A reason for not accepting the contractor's design is that

- it does not comply with the works information

...

The contractor does not proceed with the relevant work until the project manager has accepted the design.

...

21.5 The contractor's liability to the employer for defects due to his design that are not listed on the defects certificate is limited to the amount stated in the contract data ...

...

Take over 35

35.1 Possession of each part of the site returns to the employer when he takes over the part of the works which occupies it. Possession of the whole site returns to the employer when the project manager certifies termination.

...

4. Testing and Defects

Tests and inspections 40

...

40.4 If a test or inspection shows that any work has a defect, the contractor corrects the defect ...

...

Correcting defects 43

43.1 The contractor corrects defects whether or not the supervisor notifies him of them. The contractor corrects notified defects before the end of the defect correction period. If the project manager and the contractor agree before the end of the defect correction period, the defect correction period is extended. The defect correction period begins at completion for defects notified before completion and at the expiry of the mobilisation period for other defects ...

43.2 The supervisor issues the defects certificate at the later of the defects date and the end of the defect correction period.

...

45.1 If the contractor has not corrected a notified defect within its defect correction period, the project manager assesses the cost of having the defect corrected by other people and the contractor pays this amount.

...".

[13] There then followed certain bespoke clauses particular to this contract:

"46.1 (Clause Z2.2) The contractor's obligations for the correction of defects does not include repairs, adjustments, replacement or maintenance as a result of normal wear and tear or degradation in the

performance of the works as a result of the employer's failure to operate or maintain the works in accordance with the operations maintenance manuals.

If the employer cannot use the whole or part of the works due to a defect which arises after completion and before the defects date, the defects date is extended by a period equal to the period during which the employer, due to the defect, is unable to use the whole or part of the works ...

46.2 (Z2.3) If part of the works is repaired or replaced due to a defect which arises after completion and before the defects date, the defects date ... is delayed by a period equal to the period between completion and the date when the part has been repaired or replaced.

...

Latent Defects

46.4 (Z3.1) Notwithstanding the issue of the defects certificate, the contractor makes good at his own cost and expense and with all possible speed any defect which appears or occurs during the period of ... twelve years following completion ... provided the defect is not caused by normal wear and tear ...

Upon receipt of written notice of such a defect the contractor without unnecessary delay submits for acceptance by the employer his proposals to remedy the same at no cost to the employer. Upon receipt of the acceptance of the employer to the contractor's proposals ... the contractor ... implement his proposals as accepted with all due speed.

If the contractor fails to submit his written proposals ... the employer may employ and pay other persons to design and carry out the necessary remedial work ... and the contractor is liable for all costs and expenses in connection with such remedial work ...

...

Availability guarantee (Z6)

48.1 Between completion and the defects date the employer assesses the station availability monthly and notifies the contractor.

48.2 The contractor pays the amount of low availability damages stated below at the end of each of the first four half year periods. The availability standard and amounts for low availability damages are as follows: ...

The total of the availability damages does not exceed £1,000,000, which shall be the sole and final remedy for the event described in this Clause Z6.

...".

[14] Returning to the core clauses, the contract continued:

“6. Compensation Events

Compensation events 60

60.1 The following are compensation events.

...

(14) An employer’s risk event occurs.

...

Limitation of liability Z11

80. Neither the contractor, nor the employer excludes or limits any liability to each other for personal injury ... to the extent that such injury results from the negligence or wilful default of itself, its servants, agents or sub-contractors.

... the total liability of each of the contractor and the employer ... to the other does not exceed the applicable financial limit for each category of liability as follows.

... in the case of all liability for loss of or damage to the other party’s property (except the works, plant and materials and equipment) ... GBP 10,000,000 ...

In the case of any other liability under the contract ... liability is limited to the tendered total of the prices.

Neither the contractor nor the employer are liable to each other for indirect or consequential damages and/or loss of profit except as provided for in the conditions of contract.

8. Risks and insurance

Employer’s risks 80²

80.1 The employer’s risks are

- Claims ... which are due to ...
 - negligence ... by the employer ...
 - a fault of the employer or a fault in his design.
- Loss of or damage to the works ... due to
 - war ...

² The insertion of the clause above resulted in there being two clause 80s.

-
- Loss of or damage to the parts of the works taken over by the employer, except loss or damage occurring before the issue of the defects certificate which is due to
 - a defect which existed at take over
 - an event occurring before take over which is not itself an employer's risk ...
- ...
- Other employer's risks stated in the contract data.

The Contractor's Risks 81

81.1 From the starting date until the defects certificate has been issued the risks which are not carried by the employer are carried by the contractor.

Repairs 82

82.1 Until the defects certificate has been issued ... the contractor promptly replaces loss of and repairs damage to the works.

Indemnity 83

83.1 Each party indemnifies the other against claims ... due to an event which is at his risk.

83.2 The liability of each party to indemnify the other is reduced if events at the other party's risk contributed to the claims ...

Insurance cover 84

84.1 The contractor provides the insurance stated in the Insurance Table ...

84.2 The insurances are in the joint names of the parties and provide cover for events which are at the contractor's risk from the starting date until the defects certificate has been issued.

INSURANCE TABLE

Insurance against	Minimum amount of cover or minimum limit of indemnity
Loss of or damage to the works, plant and materials.	The replacement cost, including the amount stated in the contract data for the replacement of any plant and materials provided by the employer.

...

Insurance policies 85

...

85.2 Insurance policies include a waiver by the insurers of their subrogation rights against directors and other employees of every insured ...

85.4 Any amount not recovered from an insurer is borne by the employer for events which are at his risk and by the contractor for events which are at his risk."

[15] It is worth observing that Option M appears in the following form, which includes a heading, in the NEC 2 contract's secondary options section:

"Option M: Limitation of the contractor's liability for his design to reasonable skill and care

The contractor's design M1

M1.1 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."

The works information

[16] There were three relevant elements to the works information.

[17] First, part 2 of section 1 ("General") of Schedule Part 3 contained a "description of the works". The description began (para 2.1) by setting out the employer's objective of having a hydro scheme designed and constructed, which would provide, *inter alia*: "Reliable service without the requirement for major refurbishment or significant capital expenditure within the design life of the scheme". The works were (para 2.2) the design, construction and commissioning of the scheme, which was to have a capacity to generate 100 MW.

[18] Part 6 of section 1 dealt with the "Contractor's Design". It provided (6.1.1) that the contractor was responsible for the design of all of the works. It described (6.2.1) the design procedures, which were to be carried out in three phases *viz.*: concept design; preliminary design; and detailed design. Each element required (6.2.1, 6.2.8.1) to be submitted "for

acceptance” to the pursuers’ project manager, namely (initially) Neil Sandilands. The detailed design, once accepted, was to be “developed through construction detailing and method statements” (6.2.8.4). Design documents could be “accepted, not accepted (returned with comments) or accepted subject to comments” (6.2.10).

[19] Part 6 of section 1 contained the “Design Brief” which provided:

“6.3.1 Guaranteed Performance

The contractor designs a hydro scheme ... with a minimum guaranteed performance. The performance criteria are detailed in the contract data Part 1.

6.3.2 Design Life

The design life of the principal components are detailed below. The components provide reliable service without requirement for major refurbishment or significant capital expenditure for a period of time as follows...

Civil Works 75 years.”

[20] Part 7 stated (again, para 7.5) that the “defects date” was 104 weeks after the issue of the completion certificate. The contractor was to attend a defects inspection during the final 4 weeks before the defects date.

[21] Secondly, section 2 (“civil works”) of Schedule Part 3 referred to the HRT. Part 2 dealt with general requirements including tunnel design; specifically (para 2.3.1) support. The assessment of support to the HRT was initially to be based on the Q-system, which involved an arithmetical assessment based on numerical values attributable to various rock conditions. Paragraph 2.3.1 continued:

“Following each excavation cycle the contractor maps the face, crown and sidewalls to enable the classification of the ground in accordance with the rockmass classification system. The contractor agrees the rockmass parameters with the project manager and the support class is agreed prior to its installation ...”.

The contractor could (as in due course the defenders did) adopt an alternative comparable system, subject to its acceptance by the project manager.

[22] Part 6 dealt specifically with the HRT. It was to be designed (para 6.1) to transport water under pressure from the reservoir to the turbine. The initial concept was that the HRT was to be lined throughout its length with shotcrete (sprayed concrete), except where a full *in situ* concrete or steel lining was to be provided or as otherwise agreed with the project manager. In due course, the proposal to have a completely lined tunnel, which formed the basis for Part 6, was abandoned.

[23] Thirdly, there was Schedule Part 7, Appendix 6, being the defenders' "design statement". This had been prepared by the defenders' subcontractors, namely Pöyry Energy JV (Pöyry), a Finnish company which had been engaged to design the civil works, including the HRT. It had been part of the tender documentation compiled in 2004. It provided an explanation for the changes which had involved a major departure from the original lined tunnel design. It assumed (para 2.2.2.1) the installation of shotcrete (75mm thickness over 50% of the tunnel with no concrete invert) where the rock was determined to be class I or II (*infra*). It was anticipated that shotcrete would be required over 90% of the HRT. A lining corresponding to classes III and IV (150mm shotcrete over the whole tunnel with a concrete invert) was predicted over the remaining 10%. It was stated (para 2.4) by the defenders that, with the use of a tunnel boring machine (TBM), the HRT was feasible with 60% of the tunnel left unlined (class I). This, it was said, would not compromise its required service life.

[24] The design of rock support (subsequently called the Pöyry Guidelines) was to be carried out using the following procedures (para 2.4):

“Determine risk situations (geological scenarios) for which the rock support should be designed ... [refer to reference ground conditions report];

Design a range of typical sections (one for each excavation class) covering foreseeable risk situations;

Determine forecast for intensity of risk situations along tunnel length and hence for distribution of excavation classes along the tunnel [refer to reference ground conditions report];

Determine actual support requirements during the tunnel advance based on actual conditions encountered, particularly with reference to the identified risk situations;

Adapt rock support based on actual rock conditions (eg adjusting the balance of shotcrete and rock bolts, adjusting the thickness of shotcrete, adjusting rock bolt length and pattern);

Observe the behaviour of the rock behind the face in order to judge the adequacy of the initial support and any need for additional rock support and/or final lining (such as shotcrete lining to prevent erosion of weak rock layers)."

[25] The design statement provided (para 2.6) information to the effect that general reinforcement was required when certain conditions were encountered. These included areas where rock was susceptible to erosion and in areas where long term stability could be endangered by dynamic water pressure.

[26] The works information contained a substantial report (Sch Pt 3; Appdx 12) setting out the defenders' understanding of the relevant ground conditions. These were said in the report (para 1 "Introduction") to form part of "the agreement for the works". In relation to the HRT, the excavation classes were said (para 4.1) to be defined on Drawing D201³ appended to, and in chapter 7, of the report. The Drawing was of cross sections of the HRT showing the rock support applicable to each class. Chapter 7 began with a foreword which stated that:

"During construction, the support requirements will be decided at the face, based on the actual conditions".

The "actual conditions" were to be understood as encompassing any observation likely to affect the stability of the unsupported excavation. The class was not primarily a statement of rock mass but something which reflected "the type and quantity of support installed

³ see Appendix 1 to this Opinion

within the tunnel". It was to be "considered as the adequate and sufficient response to a particular or number of hazard situations".

[27] The report (para 7.4) divided the "excavation classes" into four. Class I (unlined) was "good rock condition" with no hazards other than small unstable wedges or slabs of less than (<) 0.2m³. Typical rock properties included an absence of sheared zones or erosion potential. Either no support would be needed or it would be limited to spot bolting and/or local shotcreting to the roof. Class II (partially lined) was "fair to poor rock conditions" involving a hazard of, amongst other things, block fall due to unstable wedges or slabs. Rock properties would encompass "blocky rock structure with closely spaced joints" and single shear zones with a thickness <10cms and "non erodible gouge". This needed "systematic support above the spring line" (the half way point on the vertical). Class III (fully lined) was "poor rock conditions" involving an unstable roof and side walls, moderately to highly weathered rock, subject to ravelling (tangling), "weak erodible rock, eg sheared mica schist and quartz mica schist with high mica content". Rock properties included sheared zones, notably "unfavourable orientation of weakness zones". Systematic support over the full HRT perimeter was deemed necessary.

[28] Class IV (fully lined with steel) was "very poor rock conditions" with unstable roof and side walls, moderately to highly weathered rock, subject to ravelling. Hazards were "fault zones with erodible kakirite (dip <50° or width >0.5m)" and "Loose erodible gouge of faults". Typical rock properties would be "faulted zones", "very unfavourable orientation of weakness zones", typically occurring where there were fault zones with weak kakirite and strongly sheared zones. Kakirite had earlier been defined as "Material resulting from rock faulting/shearing. Structure of loose material, with no or low cohesion. Characteristic

of young faults". Systematic support over the full perimeter was necessary, with shotcreting and bolting being considered insufficient to stabilize the excavation.

[29] The report had anticipated (para 8.3.1.2) that the presence of "highly weathered rock at tunnel elevation, apart from the fault and sheared zones was ... unlikely". Generally, high strength rock was predicted. Hence, it was thought (para 4.1) that, over the whole length of the HRT, only 1.5% would need class IV support, 6% would need class III, 23.8% class II and 68.7% class I (cf Sch Pt 7, Appdx 6 *supra*). As matters transpired (*infra*), no class IV support, and only a very small section of class III support, was installed.

The design

[30] Two documents were said to constitute at least part of the detailed design. This design was not part of the works information and its terms were therefore not part of the formal contract, other than by reference. The first document was the HRT Rock Support Methodology (RSM) (Drawing 152 DC 12 20 97 02 with attached comment sheet) which, incidentally, showed (Fig 5)⁴ the CFZ at around chainage 2000 (the chainages being references to the distance in metres from the reservoir rather than imperial measures). The CFZ was thought to be some 115m wide. It was anticipated that it would contain predominantly rock classes III (80%) and IV (20%) (see the text below Fig 5). Under a heading "Water outflow & loss", there was a statement (para 6.1.5) that "Erodible zones will have to be shotcreted irrespective of the associated rock class". Sometime after the commencement of the excavation, the pursuers' geology consultants, namely Jacobs (Jacobs Gibb Ltd and Jacobs UK Ltd), had asked the defenders to clarify what was meant by "erodible", but no reply was forthcoming.

⁴ see Appendix 2 to this Opinion

[31] Part of the RSM was Table 11⁵. This was described as a “Geotechnical risk assessment after excavation”. It contained a reference to the hazard of “erosion of erodible rock during operation”. 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 countermeasures in the form of the “application of shotcrete if not already covered/protected’ by steel rib support”.

[32] The second document was the drawing D201, which had been referred to in the ground conditions report (para 4.1 *supra*). It contained illustrations of a cross section of the HRT showing what constituted the recommended support for each of the four rock classes. Class I required two angled 2.2m rock bolts at, and 50mm shotcreting of, the crown. Mesh was optional. Shotcreting could be reduced or omitted where good rock sections were clearly identified. Class II involved four rock bolts at, and 50-80mm shotcreting of, the crown. Mesh was compulsory. Shotcreting could be extended down the sidewall “as required”. Class III showed eight rock bolts above the spring line, with 100mm shotcreting throughout the circumference. The installation of a bolted steel plate to the crown was optional. Class IV involved only two rock bolts but full circumference steel ribs at 1 – 1.25m intervals. The 200mm shotcreting was also full circle with mesh. “Particular notes” on the drawing stated:

“1. Rock supports be installed to the extent required to meet the rock conditions encountered.

...

5. Rock support and surface treatment may be modified as considered necessary to adapt to the actual geological site conditions at the work site.

⁵ see Appendix 3 to this Opinion

...

7. Rock support methodology/materials specification see 152 DC 11 50 97 02” (*supra*).

The progress of the works

[33] The contract was signed on 22 and 28 December 2005. At a meeting between the parties on 2 February 2006, it was agreed that they would each employ geologists on site to agree the rock classification as the excavation proceeded. A similar decision was minuted at a meeting of 24 May 2006. This method was put into practice by means of rock excavation classification (REC) sheets⁶ devised by the defenders’ principal engineering geologist, namely Mr Taylor. The REC sheet template referred expressly to the descriptions of classes I, II, III and IV (*supra*). The template anticipated completion by marking particular portions of the text and ticking boxes representing the geologist’s view of potential hazards, typical phenomena and typical rock properties. The geologist’s view of the overall support category would be recorded in a box on the sheet. There was a small section into which comments could be inserted. The sheets were signed as prepared by Mr Taylor, confirmed by the defenders’ subcontractors, namely Pöyry, and approved by the pursuers’ subcontractors, namely Jacobs. The sheets covered a variety of different tunnel lengths. Their content was converted onto maps, each covering a 25m section of tunnel. The commercial judge found (para [64]) that, throughout the excavation, no-one sought to alter, or otherwise query, Mr Taylor’s assessment of the appropriate rock class and support.

[34] The excavation of the main tunnel had begun with the TRT, which was completed in February 2007. Thereafter the HRT was excavated with the TBM passing through the CFZ in late August 2007. Although the defenders had expected to encounter poor rock

⁶ see Appendix 4 to this Opinion

conditions in the CFZ (see *supra*), they did not notice any obvious signs of this. A minute of a meeting on 9 September 2007 recorded by Angus Speirs, an engineer with Jacobs, noted that indications of the CFZ were “imperceptible”. The requisite support was deemed to be class I throughout almost all of the CFZ. Excavation of the HRT was completed in January 2008.

[35] At the proof, the pursuers focussed upon an REC sheet, dated August 2007, for chainages 2117 to 2101⁷ (ie in the vicinity of the CFZ). Although almost all of the rock class descriptors ticked were class I or II, when it came to the general description of the rock mass, it had been assessed as class III. The manuscript comments included:

“Some shear zones with QMS [quartz mica schist] kakerite (*sic*), local slab formation & blockfall in sidewalls. Rotate CII support to LHS from CH2117-2107. Extend. Shotcrete to maximum extents in shotcrete bay and backfill voids”.

The overall support category was given as CIIA; that is class II with an increased application of shotcrete. On the equivalent mapping (for chainages 2125 to 2100)⁸, there was a drawing of shears, some 1 to 1.5m apart, with blockfall having occurred prior to shotcreting. The mapping showed a shear with a dip of <50° (it was 48°). The rock mass description contained a reference to foliated rock with “closely jointed fresh QUARTZ MICA SCHIST, mod weak to mod strong”. There was no note of kakerite on the mapping, despite the reference to it on the REC sheet.

[36] The REC sheet for chainages 2084 to 2082⁹, which had been revised in February 2008, contained eleven ticks referable to the descriptors. Four were for class I, six for class II and one (general rock description) for class III. There was reference to the area being “moderately sheared”. The revised classification was class I.

⁷ see Appendix 5 to this Opinion

⁸ see Appendix 6 to this Opinion

⁹ see Appendix 7 to this Opinion

[37] An email from Mr Taylor to the TBM crew dated 28 August 2007 read as follows:

“Current conditions: Rock Class II. Now in anticipated fault zone so expect deterioration at any time.

There have been a few areas where there are local zones of better looking rock (a couple of metres wide). Whilst these superficially look like Class I conditions, they are bounded by Class II and may cover potential wedges formed in the weaker ground. Whilst we are in this fault zone, it would be prudent to maintain a minimum of Class II support unless the rock quality unexpectedly improves over many metres.”

[38] In January and February 2008, inspections of the HRT took place prior to “watering up”. Pöyry prepared a report recommending the application of strips of shotcrete and mesh to certain areas of erodible rock. Defects notice D033 (*infra*), which was issued on 26 June 2008, recorded that:

“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.”

A number of specific items were said to require attention, notably additional support measures, particularly shotcreting and extra bolting, in a significant number of locations specified in a “jointly agreed TBM HRT Rock Support Review”.

[39] On 11 March 2008, Prof Einar Broch, a geologist who had been engaged by the defenders primarily to inspect the rock trap (a pit located in the HRT above the turbine), reported that the rock mass conditions in the HRT were very good. No major weakness zones had been observed. The zones described in the Pöyry report were small and none of these could cause a serious collapse. Prof Broch regarded the support measures, which had been recommended in the report, as being more than good enough for a tunnel that was basically designed and built as “unlined”.

[40] Take over inspections occurred in October 2008. The pursuers had noticed certain items lying in the invert. Mr Speirs had expressed a concern about the condition of the lower side wall. He was reassured by Pöyry and the defenders that, if erosion occurred, it would not adversely affect the stability of the tunnel. Defects notice D041 was issued on 10 November 2008 as a result of the joint pre-watering up inspection. This recorded that one of the many defects, “whereby the construction was not in accordance with the Contractor’s design accepted by the Project Manager”, was:

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

[41] Defects notice D044, dated 17 December 2008, again listed numerous areas of outstanding work including filling “with concrete pits and voids in tunnel invert”. Nevertheless, the pursuers issued the completion certificate to the defenders on 18 December 2008. This meant that the defects date would be 18 December 2010.

The collapse

[42] Efficiency tests, which were required before the scheme could be connected to the National Grid, were carried out in January 2009. Some time in about late May or early June, and again on 10 July, 2009, odd readings began to appear at the pursuers’ control room in Perth. These might have indicated a loss of water pressure at the turbine. They were initially put down to calibration errors. It was accepted that, in hindsight, had they been acted upon, matters might have turned out differently. The scheme was officially opened by HM the Queen on 29 June 2009, when the turbine had initially failed to start. The following day, thumping noises over a period of two hours were heard by Jacobs’ engineers. There had been a progressive collapse of the tunnel from 12 April 2009.

[43] In early August 2009, judges from the Saltire Society were visiting. The parties noticed a sediment plume of discoloured water being discharged from the TRT into Loch Ness. The following day, the scheme did not achieve its operating load of 100 MW. It was only at 80 MW after 25 minutes. The turbine was shut down. The pursuers arranged a meeting at Perth on 6 August, by which time those involved had become “shell-shocked”. Divers were sent down to inspect the tunnel at the reservoir end; but the problem was not there. There was a note in the pursuers’ records stating “give direct to Hochtief now? – Neil says no”. However, Neil (Mr Sandilands), informed the defenders of the problem later that day, when defects notice D053 was issued. This was in the following terms:

“There has been an increase in headloss in the [HRT] ... resulting in [the pursuers] not being able to run the generating plant at its rated 100 MW output and deciding to shutdown the generating plant yesterday, 5 August 2009 ... in order to prevent further damage to the tunnel.

The support to the tunnel on part of its length would appear to be inadequate.

The [pursuers intend] to empty the tunnel to permit inspection and the project manager will write to you giving details of arrangements and inviting you to attend the inspection”.

[44] Dewatering and inspection of the HRT took place. Rock falls could be heard. Minor collapses had occurred, but the major one was discovered some 2kms from the reservoir. An inspection from the other end of the HRT revealed some 600m of debris running up to a complete blockage. It was initially thought that the blockage was some 270m long, but this was later discovered to be erroneous; the final figure being some 70m.

[45] Although initial relations between the parties remained amicable, this soon changed. By letter dated 31 August 2009, the pursuers, under reference to defects notice D053, instructed the defenders to proceed with remedial works in terms of clause 43.1 of the contract. The defenders refused to do so unless payment for the remedial works was to be made.

[46] By September 2009, it was accepted by both parties that the appropriate remedy was the construction of a bypass tunnel. By letter dated 25 September 2009, the defenders stated that they did not consider that they had any liability or obligation to carry out remedial works at their own expense. The letter continued:

“We do however wish to emphasize that we are ready to repair the collapse as we are obliged to according to clause 82.1 ...”.

The defenders referred to clause 61.3; arguing that the collapse constituted loss of, or damage to, the works taken over by the employer. Accordingly, the event was an employer’s risk under clause 80.1 and a compensation event under 60.1(14). The cost of repairs fell to be reimbursed under the employer’s property insurance. Under clause 83.1, the defenders were entitled to be indemnified by the pursuers and compensated for all costs due to the occurrence. The defenders said that there were no defects in the works noted at the time of the take over and no evidence of any defect for which the defenders were responsible. The parties’ positions have hardly changed ever since.

[47] On 27 October 2009, defects notice D055 was issued. This notified collapses and block falls in the HRT from the reservoir to the blocked zone and continued:

“Ch 2150 – Total collapse, debris fills tunnel to crown; rendering tunnel inaccessible over a length of approximately 270m.

Ch 2420-2735 – Massive in-tunnel debris, not filling the tunnel completely, from the collapse that starts at Ch 2150”.

There were three references to voids and shears in the HRT in the area down towards the turbine. The areas identified outwith the blocked zone would, in due course, form part of the pursuers’ claim for “secondaries”.

The repair works

[48] On 12 November 2009, the defenders offered to construct the bypass tunnel, provided that this was on a cost reimbursable (Option E) basis. This was not accepted. In late November 2009, the pursuers invited the Royal BAM group to tender for the bypass tunnel. An estimate of £30 million was initially provided. On 7 December 2009, the pursuers sent a letter to the defenders requiring them to provide a programme for the remedial works and to agree to 50/50 cost sharing until liability could be determined. On 14 December 2009, the defenders declined this offer. On 18 January 2010, the pursuers notified the defenders that they intended to appoint BAM to undertake the recovery project. They formally appointed them to do so in March 2010. In January 2011, a supplementary agreement was reached between the pursuers and the BAM, with a revised estimate of £85.7 million. Meantime, the pursuers had issued defects notice D058 regarding secondary defects. On 28 October 2011, the pursuers authorised a total of £137 million to be spent on the remedial project. The works were completed in August 2012, when the scheme began generating the required amount of energy; producing £20 million of annual revenue.

The Adjudications

[49] On 7 June 2011 the defenders referred the issue of responsibility for the collapse of the HRT to Adjudication. In a decision dated 24 November 2011, the adjudicator (Robert Galbraith QC) addressed, first, the issue of the standard of care imposed on the defenders. The adjudicator concluded (para 45.3) that:

“... the Contract provides that for [the defenders] to escape liability [they] must establish ... that [they] ‘used reasonable skill and care’ to ensure that in choosing the rock support ... [they] complied with the Works Information.”

[50] The adjudicator considered, secondly, whether the defenders had used reasonable skill and care. He noted (para 53.1) that it had been agreed (in the Works Information) that the determination of the support requirements was to be based on the conditions encountered as the HRT advanced. He found (para 53.13) that:

“That is how [the defenders] carried out the decisions as to rock support. Their decisions, using the [defenders’] classification system, were being checked by Jacobs (for the [pursuers]) using the Q system ... I conclude that the tunnel support within the collapsed area ... was in accordance with the Works Information.”

The RSM was appropriate and had been properly applied on site. Accordingly, he also concluded (para 54.3) that:

“the tunnel support within the collapsed area ... was in accordance with the Contractor’s Design as accepted by the Project Manager”.

In an interesting passage, the adjudicator ended (para 56.13) his analysis of this issue as follows:

“Of course, the contractual responsibility remained upon [the defenders], but there seems little doubt that, as a matter of fact, the decisions taken at all material times were decisions that commanded the support of all the professionals (including the [pursuers]/Jacobs) on site. In such circumstances ... [the defenders have] established that [they] carried out [their] functions in mapping and producing the RECs, and choosing the rock support categories, and confirming those in subsequent inspections, with reasonable skill and care.”

[51] The adjudicator turned, thirdly, to whether the collapse had been a defect or a compensation event. He found (para 57.1) that:

“... the rock support works as designed and constructed did not constitute a Defect for the purposes of Clause 11.2(15). It is true that a collapse subsequently occurred. However, that was not because there was a Defect for the purposes of the Contract. It occurred simply because there are inherent risks of rock falls and collapses in unlined tunnels. These are part of the risks that the Parties are aware of when the price is being negotiated. The incidence of such rock falls and collapses can be greatly reduced by using a fully lined tunnel, but this would cost far more than an unlined tunnel.”

He held that there was no defect which existed at take over “since the rock support specified and installed was appropriate for the purposes of the contractual terms”. The damage, which occurred after the works had been taken over, was an employer’s risk. The adjudicator also held that the secondaries, being claims relative to areas of the tunnel unaffected by the collapse, were not defects.

[52] A second adjudication proceeded before a different adjudicator (Richard Fernyhough QC) who issued a decision on 26 June 2015. This ordered the pursuers to pay to the defenders €339,356.31 and £28,248.81 in respect of costs incurred by the defenders in the recovery project during the period from 5 August to 31 December 2009; all in terms of the indemnity in clause 83.1, being costs “due to the collapse”. The costs were primarily those of making the site safe, carrying out investigations, holding meetings and drawing up outline remedial proposals (see para 46). The defenders had claimed much greater sums amounting to €1,194,401.24 and £582,128.86, including legal and expert fees as well as their own staff costs. A large proportion of those were disallowed on the basis that the causal connection between the collapse and the costs had been broken when the defenders ceased to be involved in the remedial project. Thereafter the work carried out by the defenders had been as a consequence of commercial decisions, which were made in their own interests and not effectively caused by the collapse, in order that they could defend themselves against future claims.

Selected testimony at the proof

[53] Much of the proof was taken up with testimony about whether the defenders, and in particular Mr Taylor, had been negligent in the assessment of the required support or in their application of the RSM and drawing D201 criteria. In order to assess the commercial

judge's findings in this area, it is necessary to delve some depth into the testimony of the experts.

Prof Andrew Sloan

[54] Prof Sloan was the principal expert witness for the pursuers. He was a director of Donaldson Associates. Prof Sloan visited the site on 14 August 2009, shortly after the collapse, and again on 16 September 2009. In his report, dated August 2011, he concluded that the collapse was centred on the CFZ; the presence of which had been "clearly" referenced in the contract materials. The defenders had identified erodible rock in shear zones within this fault, but they had failed to support and protect them in the manner required by the works information and design. The defenders' failure to install sufficient support had been directly responsible for the collapse.

[55] During operation, the action of the water in the HRT had eroded rock from multiple shear zones. The erosion had been progressive and ultimately involved a large volume of material, including blocks of rock that had been bounded by the shear zones. Upon dewatering, a huge and catastrophic collapse of the ground above the tunnel had occurred. A void of 2,374m³ existed to a height of 60m directly above the tunnel at the point of collapse.

[56] As a generality, site conditions had been suitable for an unlined tunnel, but careful geological investigation and tunnel support had been required to ensure that the ground conditions were recognised and dealt with appropriately. The RSM had not provided a detailed explanation of how the excavation classification system ought to have been implemented. No details had been given linking the collection of data to the selection of support. The observations of actual conditions were to be given equal weight. The design

had not complied with the works information. It had assumed that the width of the CFZ would be 5m, but this was contradicted by the information in the works information which suggested it was 115m wide.

[57] There was a fundamental difference between rock classes I and II on the one hand, and III and IV on the other; the latter having the potential to erode either immediately after excavation or under operational conditions. Any rock described as having the attributes of “erodible kakirite”, “weak erodible rock” ought to have been classified as either III or IV. To be defined as III, any fault or shear zone had to be of a thickness of less than 0.5m wide with a dip of $<50^\circ$. The only differentiating factors between classes III and IV was that, for class IV, the width of any fault zone required to be $>0.5\text{m}$ and the dip $<50^\circ$. In some 56 areas the defenders had not, from their own data, identified the correct excavation class in accordance with the design.

[58] There had been a significant amount of erodible rock in the collapsed zone and frequent shear zones had been recorded over the full width of the CFZ. Although the mapping had used class III terminology to describe these zones, the defenders had assigned and installed only class I and II support. The works information and design required every shear zone to be supported by the application of shotcrete over the full perimeter, as the minimum class III support. The shear zones were not provided with class III or IV support, because an assumption had wrongly been made that the performance of the rock would be controlled by the dominant, and not the worst, recorded excavation class. In summary, it had been apparent that the defenders had identified erodible rock that, based on their own records, should have been attributed to class III. They had failed to do this.

[59] The February 2008 Pöyry design statement had recorded erodible rock at 11 out of 17 areas which they had inspected. It stated that the HRT, particularly the invert, had not

been inspected in detail. Twelve of the 17 areas referred to signs of deterioration, bulging/squeezing, and shear zones. Two out of the 17 were referred to as “a big bad zone with lots of weak material”. In four of the areas, over-break or wedge failures had been identified. Many of the locations should have been identified as class III.

[60] The joint inspection of the HRT in October 2008 had noted unprotected sheared and weathered rock that could erode under operational conditions. The pursuers had expressed concerns about this. It had been explained that the agreed site approach was not to shotcrete the lower sides of the tunnel walls. If erosion had occurred, it was said that it would not significantly affect the stability of the tunnel. The defenders had therefore been aware that there was rock which was susceptible to erosion but had been left unprotected.

[61] In the area of the collapse (chainages 2121 to 2050), the tunnel had been inadequately supported. The requirements of the works information and the design had not been met. Erodible rock was present and had eroded at multiple locations. Class III or IV support should have, but had not, been installed. At chainages 2117 to 2101, there had been evidence of faulting, using the criteria of erodible rock. The REC sheet had mentioned kakirite and erodible rock over quite a length. This had not been reproduced in the mapping. The REC sheet findings indicated class III. The assessment of this area as class II had been caused by the absence on the mapping of erodible rock. The mapping had not identified any need for class IV support. In parts it would have been class III. The extent of erodible rock had been underestimated, albeit with hindsight. There was not enough evidence to recommend class IV support, only class III. Erring on the side of caution meant that class IV should have been installed, although class III would have stopped the erosion and could have prevented the collapse. A collapse might still have occurred, but not one of the same magnitude.

Prof Håkan Stille

[62] Prof Stille had been instructed by the pursuers for the purposes of the litigation. He had produced a report dated 22 October 2014. He had considered the RSM to be appropriate for the expected geological conditions. There were ambiguities in the indicators for defining classes in the RSM. The proposed support for the HRT in respect of the different classes had been adequate, provided proper action was taken regarding the risk of under-supporting the wall below the spring line and where there was erodible rock and gouge material.

[63] In a second report dated 27 May 2015, Prof Stille stated that the contract had not left responsibility for determining support to an engineering judgment at the tunnel face. Rather, the support to be installed depended upon the actual hazard situation. If the hazard was present, then the contractor had to classify and support the rock accordingly. The REC sheet system had been adequate, but it contained ambiguities and had been susceptible to subjective assessment. The worst case had to govern the selection of the level of rock support. The assessment of an overall support category should have focused on the weakest link. Although minor erodible zones and shears in otherwise good rock may not have required shotcrete, the risk of instability due to erosion depended not only on the width of the erodible zones, but on other factors, including the orientation and configuration of the shears. The detailed design did not directly quantify the extent of erodible rock or gouge to be considered as requiring support. The REC sheets had not done so either.

[64] The RSM had stated what was required when the rock had been classified as poor, or very poor. In the absence of written instructions or method statements, the contract had to

be interpreted as meaning that all erodible rock, regardless of its thickness, should have been shotcreted, as being either class III or IV.

[65] The support for chainages 2117 to 2101 ought to have been class IV due to the presence of the fault zone with kakirite, sheared joint surfaces and large over-breaks. The HRT had been inadequately supported between chainages 2125 to 2050. The class identified on the REC sheets did not accord with the design. The collapse had been caused by slaking; that is to say the gradual disintegration of the rock when saturated. The appropriate action would have been to cover all sheared mica schist, and quartz mica schist with high mica content, with shotcrete either as class III or IV. This was what was stated in the RSM (para 6.1.5).

[66] The Taylor email of 27 August 2007 suggested that the classification system, including that on the REC sheets, had been for the purpose of identifying hazards during excavation only. It was necessary to have two systems; one for excavation and one for operation.

[67] At the time of the Pöyry inspections in February 2008, there had been a lot of disintegration of material, especially in the invert. Steel plates had been put down; suggesting that the bottom was not stable. If there were a problem with the bottom, there was a problem with stability in general. The indication was that there was slaking, and the risk of erosion. It should have been supported, as Pöyry had shown in the drawings, with strip or 360° support.

Arild Palmström

[68] Dr Palmström had been engaged by the defenders for the purposes of the litigation as an expert geological engineer. He had produced a report which praised the use of the

Glendoe classification system, which (as distinct from the Q-system) had been created specifically for the tunnel. The “design as you go” method was commonly used and had great benefits in construction time and cost. At no point, in the area of the CFZ, had the observable conditions merited class III or IV support. “No altered or crushed rock, shear or fault zones with clay or clayish or earth-like materials (kakerite (*sic*)) are shown in the maps or on the REC Sheets” in that area and “no instability was observed during the 14 months before watering up” (para 7.2). Dr Palmström repeated this in a later “reply” report. In the several inspections during this period, neither Mr Taylor nor Pöyry nor Jacobs had discovered anything significant in the vicinity of the CFZ.

[69] In relation to the reference to kakirite at chainages 2117 to 2101:

“... David Taylor did not ... think that this occurrence of kakirite, ... was ... so important ... he has ... ticked out the class [III] or class [IV] in the individual classification. ... [H]e has seen some clay in one or maybe more joints, but ... this clay had not very much importance”.

Dr Palmström accepted that his statement in his original report about the absence of kakirite had been erroneous. It should have referred to “kakerite of importance”. Mr Taylor was an experienced engineering geologist and, if he had seen kakirite of some importance, he would have ticked it off on the REC sheet.

[70] An unlined tunnel should not be considered complete until it had undergone testing by watering up and dewatering. After it had been operated for about a year, a tunnel should be dewatered and inspected. A rock mass, which could erode through the effects of running water, had to be protected sufficiently to eliminate the risk to stability. It would be within class III or IV.

[71] Something must have caused the collapse. What it had been was unknown. The collapse could have occurred in the manner described by Dr Rolf Wilhelm, *viz.*:

“What can be identified ... are however several smaller shear zones separated by alternating layers of intensely folded weak mica schist layers, very strong quartz schists, quartzite and thick bands of quartz. The local rock mass is therefore very heterogeneous, intensely folded and locally sheared”.

There were two shears on the mapping and the “moderately strong” quartz mica schist required some explanation. Mr Taylor’s email of 28 August 2007 had recognised the presence of the CFZ and that had been contradicted by the minute noted by Mr Speirs.

[72] The revised REC sheet for chainages 2084 to 2082 (*supra*) was “very strange”.

Table 11’s reference to “Erosion of erodible rock during operation”, requiring the countermeasure “Application of shotcrete”, was a hazard during operation and required class III or IV support. However:

“this is ...the theoretical part of it, but we have also talked about judgment and experience. So why it was not used in the collapsed zone must have been because ... – if they saw signs of this, it was not judged at class [III]. ... [T]here were at least two experienced engineering geologists, one from Jacobs and one from [the defenders], looking at this section. There were geologists who had seen the conditions at the surface, they knew that the [CFZ] was there. None of these people did ever discover that you had conditions which could give a collapse. That’s the reason why they didn’t classify it as class [III]...”

... [T]he REC sheet is ... a help to identify and make documentation of the things they have observed, but in addition, ... more important, is the judgment done by ... experienced people”.

Even if certain features, which indicated rock with a propensity to erode, had been discovered, what was being looked for were features large enough to cause a collapse.

[73] Material that was sheared and had a high mica content had the potential to cause a collapse. If Pöyry had been asked to reconsider erosion potential, and they had not looked at a particular area, this had been, using counsel’s words, a “missed opportunity”. If the mapping was right, there had been no clear evidence that class III or IV support should have been applied.

Prof Mathias Müller

[74] Prof Müller was the defenders' senior design manager on hydropower projects until 2012. He had been design co-ordinator for the project. The detailed design had consisted of the set of drawings and explanatory documents prepared by the sub-contractors, approved by the pursuers and issued for construction. However, observation and selection, adaption and adjustment of rock support were still required both during and after excavation. The design process continued until the works were accepted as completed by the pursuers. The agreed design procedure had included taking the six steps in the Pöyry design statement (Sch Pt 7; Appdx 6, para 2.4) and developed in the RSM.

[75] It was, in general, essential to assess how the rock mass would behave in water. There was no doubt that the geotechnical technicians had properly assessed the rock mass "on the spot". Table 10 had referred to the excavation hazards in the TRT, whereas Table 11 had included hazards during empounding and operation. Table 11 was a risk handling matrix used during the tender negotiations, listing every risk that might have come up. In general, the risks of the HRT had been identified as low; otherwise the parties would not have agreed to an unlined tunnel. Erosion had, in general, been considered to be a low risk, but it might have been found in particular stretches. The rock's stability due to hydraulic loading would have been considered. Pöyry had included a paragraph in the RSM on water inflow/outflow and potential erosion. They had been well aware of the purpose of the tunnel and of the need to cope with such loading.

[76] The Pöyry design statement of February 2008 had been created after Prof Müller had left the site. The inspection team must have walked the length of the tunnel; otherwise they could not have specified the sections for re-examination. The statement recorded that the whole HRT, particularly the invert, had not been inspected in detail. That would have been

because of puddles and steel plating over the invert. The document indicated that they had walked, or driven along, the whole tunnel, but certain areas were inspected in order to test the negative effects of high water pressure.

Dr Ernst Büchi

[77] Dr Büchi was an independent consulting geologist and tunnelling expert with his own company, namely GEO 96, based in Switzerland. He had been instructed by the defenders. In October 2014, he had produced a very long report covering many aspects of the case. He considered that the defenders could not have predicted the actual geology in the vicinity of the blocked zone from the information available at the time. The CFZ had not been detected in the HRT. The defenders' experience had been that class I or II support was reasonable and appropriate, even in a predicted fault zone. The mapping of the conditions encountered did not indicate a risk of a major collapse. The pursuers had confirmed the adequacy of the mapping. The inspections had not shown any warning signals. The collapse had been a "geological accident".

[78] Dr Büchi commented in his witness statement that the situation as mapped at chainages 2050 to 2120 was typical of what had been found generally in the tunnel. That for chainages 2905 to 2825 was similar, with local overbreaks causing minor rock falls during or after excavation.

[79] Dr Büchi's initial report said that the collapsed area was only 8 to 10m long. The bypass tunnel had been of excessive length. The majority of the secondary remedial work had been unnecessary. Some minor repair and maintenance work after dewatering was to be expected. In general, the secondaries were not defects and posed no threat to stability. The remedial works had taken too long. The downstream access tunnel (DAT) had not been

required. The concrete invert had been inappropriate and constituted a change in the project. The most reasonable solution would have been to tunnel through the blockage, which would have shown a collapsed crown section of only 8 to 10m. Alternatively, a much shorter bypass tunnel could have been constructed.

Prof Einar Broch

[80] Prof Broch had been instructed by the defenders. He had given evidence in the Adjudication about whether the REC sheets had been used just for the purposes of providing temporary rock support after excavation and not for the permanent operation.

He had said:

“Yes, and that is what it is, nothing more, nothing less.

...

This is mapping the situation in the tunnel during construction. Nothing more and nothing less.”

Knowing that the tunnel was going to be watered, a decision had to be made on the level of permanent support, but that was a different stage. The level during excavation was typically the contractor’s responsibility. Long term stability was typically the client’s or the owner’s responsibility. These were two separate steps, which is why the tunnel had been inspected and a report produced in October 2008. On several occasions, the HRT had been inspected by the pursuers and their engineers, as well as the defenders, with a view to asking what was to be done with it prior to watering up.

[81] In evidence at the proof, Prof Broch repeated that construction was a matter for the contractor, whereas operation was for the employer; at least in Norway. In February 2008, the parties had been specifically considering erosion potential during operation. Further REC sheets were prepared and some were amended. Prof Broch had inspected the HRT on

11 March 2008. He had reported on 30 April 2008 that the rock mass was very good; it being one of the driest tunnels he had ever inspected. No major weakness zones had been observed. Those in the Pöyry report had been small and none could cause serious collapse. The support measures recommended by Pöyry had been more than good enough for a tunnel that was designed and built as unlined.

[82] At chainages 2117 to 2101 there were records of sheared rock, mica, kakirite and other matters. However:

“... at what volume? How much? It has just been ticked off. It doesn't mean that there's a lot of this or that. It only indicates that it has been observed. The professional geologists there were responsible for making the necessary support. They have come to a conclusion that the rock is safe enough or the rock mass in the perimeter is safe enough based on what they have seen.”

The Pöyry inspection in February 2008 had been the first after the completion of the excavation. There was a record of erodible areas, but “that's not erodible rock”. There were eroded shear zones. He had suggested that some concrete might have been used to fill them. The decision had been taken not to do anything before watering up, but to wait and inspect it carefully at the first dewatering. This was a typical unlined tunnel approach. Fallouts during dewatering is part of the unlined design. That is why there is a rock trap and an agreed dewatering. There had been very careful mapping of the CFZ area. There had been no indication whatsoever, as agreed by everyone involved, that anything was going to happen. There was nothing in what had been exposed to indicate that there could be a major fall out.

[83] In his report of May 2015, Prof Broch had expressed disagreement with the views of Profs Sloan and Stille, in that it was his view that the design process continued right up until the point of watering up. What the defenders had been doing during construction had been not merely implementation, but carrying out a fundamental part of the design process. The

test at watering up and dewatering would inform the decisions about the sufficiency of support. The performance of the tunnel would be reviewed. A risk had been taken in February 2008 when some local problems were seen, but that was part of the construction of an unlined tunnel. Any unlined tunnelling system necessarily had a greater residual risk of rock fall than a fully lined system. An unlined tunnel was a trade-off between speed and cost on the one hand and risk on the other. The employer accepted slightly more risk in return for substantial cost and pound savings. The only way in which the risk could have been eliminated would have been to line the tunnel fully with heavy support. Even then, there was always a residual risk of localised collapse.

Hot Tubbing (concurrent evidence session involving Drs Martin Smith, Büchi and Palmström and Profs Stille, Eivind Grøv, Sloan and Broch)

[84] The session on whether the collapse could have been foreseen commenced with Prof Grøv stating that an area of potential weak rock mass had been seen but “maybe not appraised correctly” during the excavation and inspection phases. This did not mean that the collapse could have been foreseen. If someone had foreseen a collapse, “they would have done something more than what was actually done”. Many of the indicators for a collapse had been observed and recorded. Prof Stille said that, theoretically, the collapse, that is the slaking (disintegration of rock) or higher than anticipated load, could have been foreseen. If lack of support could have been recognised, the collapse could have been foreseen. Evidence of poor rock existed. The section of the tunnel in the CFZ had been under supported.

[85] Dr Palmström said that the mapping had been of good quality. It was easy to understand what had been observed. The tunnel had been inspected several times. Areas

where additional support was required had been identified. A progress report had said that the CFZ had been imperceptible. None of the experienced people involved had observed any signs indicative of the potential for a “great collapse”. Dr Büchi said that, listening to the argument about shears and slaking, the whole tunnel ought to have been lined. Those observing the tunnel had been aware of a minor risk and had accepted that risk. The collapse could not have been foreseen.

[86] Prof Broch said that the collapse could have been foreseen, if the clear signals during operation in April/May had been understood. A total collapse could have been prevented. Dr Smith, who was the Science Director of the British Geological Survey, referred to signs of the CFZ from the bore hole drilled prior to excavation. Prof Sloan thought that the difference between the CFZ and the rest of the HRT had been identifiable during excavation.

[87] Prof Stille said that he understood Mr Taylor’s email to mean that there was unstable ground at chainages 2101 to 2117. Pöyry had recommended a strip solution in certain areas. There were mica schists, which would slake, connected to sheared mica schist. There was some overbreak and some class II rock requiring additional support.

[88] Dr Büchi said that the rock mass in the CFZ was all class I or II. None would have required III or IV. The overbreak was minor. The rock was weak and thus erodible because of the presence of shears, which reduced cohesion and allowed water penetration.

Prof Sloan said that the presence of mica did not of itself mean that rock was erodible.

Prof Stille agreed with Prof Broch on cohesion and water penetration. Weak erodible rock was defined in the contract as “sheared mica schist and quartz mica schist with high mica content”. That type of rock would fall into pieces when submerged.

[89] Prof Broch did not know if mica schist, and quartz mica schist with a high mica content, had been present at chainages 2050 and 2121. Dr Smith said that the mapping

demonstrated that it had been present. A shear had also been recorded. Prof Grøv agreed and said that this had required class III support. Prof Stille also agreed; but whether the support should have been class III depended upon whether the support related to excavation or operation. Prof Sloan said that it had been clear from Mr Taylor's email that there was quartz mica schist in the CFZ area where the collapse had occurred. There had been a reference to kakirite too. There was no doubt that the faulting and the influence of the CFZ had been recorded in the mapping.

[90] In relation to the required level of support to prevent the collapse, Dr Büchi said that it was evident, from the shotcreting of the lower sidewalls and the invert, that what was being considered had not just been safety but the final lining. Those mapping and inspecting the tunnel had recognised the rock as erodible. The REC sheets had showed erodible rock as class III, but this was only one of ten parameters. There was nothing to say that a particular area had to have class III support. Dr Palmström agreed. It was a matter of judgment. Prof Broch emphasised the combined nature of the mapping. It had been done by a very experienced engineering geologist. It had involved a general evaluation of the whole information available. The defenders, and the other "parties", had been fully aware that this was going to be a watered up tunnel and what was being talked about was long term stability.

[91] The commercial judge posed the question: do the experts agree that an engineering judgment had to be exercised based on the actual conditions that were encountered?

Prof Broch and Drs Büchi and Palmström said "yes". Prof Grøv said judgment had to be exercised twice. Prof Stille said "yes, of course", but the geologists had to follow the contract. Prof Sloan agreed that judgments had to be made, but the design had mandated a

process of implementation by attributing the conditions to a specific class. Once that had been done, the level of support had been mandatory.

[92] In exercising judgment, Prof Sloan had seen no evidence of a rigorous joint mapping exercise. Table 11 had set out the hazards during excavation and for long term stability. The only consideration regarding the latter had been erosion. Prof Stille agreed. Table 11 was very important, where it stated that erodible rock had to be covered. There was no judgment involved. Prof Grøv agreed with both. Dr Palmström said that the multiple inspections had been carried out with a view to looking at possible slaking and erodible rock. Dr Büchi said that, at the time of contracting, there were appreciable risks and that, if detected, the parties had to act in accordance with the design. When erodible rock was detected, it was at least class III, despite the presence all other factors. The mandatory element came from para 6.1.5 of the RSM. Irrespective of class, erodible rock had to be shotcreted. Prof Broch had been the only expert who had been in the tunnel before the collapse. In March 2008 he, and Mr Taylor, had been taken to locations which, from a long term perspective, could be dangerous based on the mapping of the previous February. They had been looking at long term stability.

[93] Turning to whether any of the experts felt able to criticise the judgments taken in the tunnel, Prof Broch said “no”. Dr Büchi agreed that the rock was class I or II. Dr Palmström recognised that it was difficult without seeing the actual conditions. He did not think that he could, with hindsight, reach a conclusion on what had been done by experienced geologists who had been working in the tunnel for a long time and had documented their findings in the REC sheets and mapping. Prof Grøv said that the only clue from the collapse zone was the mapping. He was unable to criticise what had been done.

[94] Prof Sloan took a different view. He did criticise the geologists on site. Having walked through the TRT and HRT, he was of the view that there had been systematic “under-realisation of the importance of erodible rock for the long term stability of this tunnel”. There was a lack of attention to the consequence of leaving erodible rock exposed. The defenders had been responsible for this. The erodible rock had been inadequately protected and that had led to the collapse.

[95] Prof Stille had criticised the overall classification system, but he would not criticise the geologists. There were eight indicators relating to different issues, but no rule about how the overall excavation class should be assessed, based on those indicators. That was left to engineering judgment. This was a fault. If the contract had stated that erodible rock had to be covered, implementation did not involve an engineering judgment.

[96] On the level of rock support required to prevent the collapse, Prof Sloan thought that 360° shotcreting would have gone a long way to prevent a progressive collapse. The appropriate level of support ought to have been class IV (shotcreting with steel ribs). Prof Stille thought that the erodible material ought to have been covered with shotcrete to prevent slaking. This was not enough, given that there would be a poor bond with the rock. A lot of rock bolts would also have been required. This is what Pöyry had described as a strip solution. The invert had to be shotcreted too, as erosion at the invert could progressively move upwards and lead to a collapse. The lower parts of the walls had to be covered. Prof Grønv thought that the logical answer was class IV for chainages 2117 to 2100. Class III would not have been sufficient. Dr Palmström did not think class II would have been enough. Class IV was on the safe side. Dr Büchi said that class IV support would have prevented the collapse. Prof Broch could not answer the question.

[97] In their summaries, Prof Broch said that the parties had been aware of the CFZ and had carried out careful planning in that area. The defenders had been paid for the work which they had carried out. There was no reason for them to have avoided installing the appropriate support. Careful observation of the operation of the tunnel had been needed, because there was some level of risk in having an unlined tunnel.

[98] Prof Sloan said that, when he visited the tunnel, there had been significant collapses because of erodible rock within shear zones. The Pöyry design statement had contained a mandatory requirement to protect erodible rock. Its roots were in Table 11, which looked at both short and long (75 year) term support. There had been a systematic failure by the defenders to address adequately the presence of erodible rock.

[99] Dr Büchi said that the mapping had been agreed and there had been no mandate for covering erodible material systematically with concrete. This had not been stipulated in the contract and it was not what the parties had understood at the time. During mapping, there had been no clear evidence of the presence of the CFZ. Several shear zones had been seen, but these had fallen within class I or II. There had been no indication of a need for class III or IV support.

[100] Prof Stille considered that there had been no systematic fault in the classification system. There were some 20 areas in which the rock had deteriorated. These areas were similar in type to the CFZ. The REC sheets did not cover the requirement in the RSM that all erodible rock should be covered. The ambiguities in the REC sheets and the unclear objectives were the reason for the erroneous decision not to cover weak erodible rock.

[101] Dr Palmström said that the engineering geologists had encountered the anticipated stability problems in the CFZ. None of the rock had been class III or IV. Several inspections

had been made after excavation and dewatering. The tunnel had been tested with water for almost a year. Some joints with erodible rock had been seen, but these were small features.

[102] Prof Grønv said that the rock classification system had its weaknesses. It had not included certain important parameters and was missing a clear procedure on how to decide rock class. Engineering judgment should only be used when the situation fell outwith the system.

[103] Dr Smith said that the CFZ could be seen on the surface and its existence had been evident in the data sources. It would have presented a significant zone of weakened rock where it intersected with the HRT between chainages 2050 and 2021. The mapping showed distinctive features, such as increased quartz mica schist, intense foliation, fractures in the form of shears, kakirite and overbreaks. The CFZ had caused the collapse. He felt unable to comment on why the CFZ had not been recognised “for what it was”.

The commercial judge’s Opinions

Joint insurance

[104] The commercial judge concluded that the provision for joint insurance did not displace the parties’ liabilities to each other under the contract. He accepted that the authorities generally favoured joint insurance displacing contractual liability, but whether that was so would depend upon the particular terms of the contract in their context.

Clause 83.1 expressly stipulated that each party undertook liabilities to each other. There was no exclusion of liability (cf *Co-operative Retail Services v Taylor Young Partnership* [2002] 1 WLR 1419 (“CRS”). There was no reason to justify overriding clause 83.1 and to give primacy to the insurance clause 84. The requirement for a joint policy was based on considerations of utility and prudence.

[105] If liability were excluded, clauses 83.1 and 80 (Z11 version) would be redundant. There would be no need for provisions governing liability if there was no right to sue. Clause 85.2 had waived the subrogation rights against the parties' directors and employees, but not in respect of the parties themselves. As was set out in *Keating on NEC 3* (1st ed) (at para 9-029), it is unlikely that clause 84 would displace a contractor's liability for negligence. Clause 85.4 maintained the underlying risk allocation. Clauses 83.1 and 2 implied that each party bore the risk of their own negligence.

[106] In *CRS (supra)* it had been said that a stipulation for joint insurance carried with it an implied term which prevented one party suing the other. There was no such implied term in this case. It was not required for the purpose of business efficacy and it ran contrary to the contractual terms. There was no irrebuttable presumption excluding liability simply because joint insurance was in place. "That would tend to merge the law of insurance with the law of contractual interpretation" (para [87]).

Merits

[107] The commercial judge heard evidence over some 6 months, primarily focused partly on whether the defenders had been negligent in their performance of the contract, and hence whether Option M might be applicable, and partly on *quantum* of damage. This focus was reflected in the issues which the judge identified as being key. These were (Opinion para [5]): why did the collapse occur; could it have been foreseen; were the defenders to blame; were the pursuers also partly to blame; were the remedial works reasonable and necessary? He classified the core of the dispute as lying in a deceptively simple issue regarding whether the defenders had misclassified the rock and thereby failed to install the correct support.

[108] The short answer (para [147]) for the cause of the collapse was that “there was not enough support: poor rock conditions coincided with insufficient shotcrete and rockbolts”. There were formidable difficulties in providing a longer answer, because there had been no full investigation of the cause of the collapse. It had ceased to be a priority once the pursuers had decided to construct the bypass. The most likely explanation was as follows (para [152]):

- “(1) The CFZ consists of interconnected faults of thin single shears with good rock in between.
- (2) The weak rock deteriorated and lost its strength when submerged ...
- (3) The flowing water washed out areas of erodible rock.
- (4) The erosion progressed and opened up larger seams.
- (5) The eroded material was progressively deposited as sediment over a significant length of the HRT.
- (6) The HRT lost stability and the tunnel collapsed.
- (7) Dewatering caused further erosion.”

[109] The pursuers’ submission was summarised as being that a defect had existed at take over and that therefore, in terms of clause 80.1, the risk was a contractor’s event. The scheme could not provide the reliable service specified in clause 6.3.2 of the works information. It did not conform to the accepted design, because the defenders had failed to install the requisite level of support to prevent the erosion of erodible rock during operation. This submission was rejected (para [163]) because Option M:

“placed an important brake on liability. [The defenders] did not guarantee the works. Instead, [they] accepted the familiar and lesser obligation of ‘reasonable skill and care’.”

If the pursuers’ interpretation were correct, the defenders would have had an overarching obligation to provide a tunnel suitable for its purpose. This would have imposed strict

liability and effectively robbed Option M of its meaning. It would also make some of the other provisions, regarding repair and maintenance, redundant.

[110] There had been no mandatory requirement to shotcrete all erodible rock (cf Table 11 *supra*). Rather (para [167]):

“The engineering geologists had to exercise judgement in considering the integrity of the tunnel. It was a holistic exercise. They had to assess the presence of any erodible material, together with the dip direction, orientation and width of any faults.”

The contention that the defenders had failed to exercise reasonable skill and care was rejected. The rock classification had been carried out jointly at the face. This was stipulated in the works information, drawing D201, the ground conditions report and the design statement. The parties had “clearly agreed the approach” (para [171]) whereby the engineering geologists would jointly determine questions of both rock classification and support.

[111] Several factors were taken into account (para [174]) in determining that the defenders had exercised reasonable skill and care, *viz.*: (1) mapping was a difficult exercise; (2) the defenders’ experts had described the standard of mapping as of good or top quality; (3) the TBM crew had said that Mr Taylor was an experienced engineering geologist who diligently performed his role, took extra care at the CFZ, but had seen nothing. The fact that he had noted weak rock on some REC sheets, reflected the care which he had taken. The judge was satisfied with Mr Taylor’s judgment that no further support had been required. After all “why go to the trouble of identifying such features and then decide to do nothing about them?”; and (4) Jacobs and Pöyry had agreed with Mr Taylor’s classification. Many experienced professionals had scrutinised the tunnel both during and after the excavation. None of them had seen any faults that might have threatened stability. None of them had recommended the installation of a higher level of support.

[112] The defenders, Pöyry, Jacobs and the pursuers had all inspected the HRT on a “metre to metre basis” in 2008, but had only uncovered minor issues, which had been resolved prior to watering up. According to a report by David Fawcett, who was described (para [181]) as a distinguished tunneller: “There is no recorded evidence of passing through any feature that would potentially cause the catastrophic collapse that has occurred.” The pursuers’ contention, that the REC sheets had been defective because they had only addressed the hazards during excavation but not operation, was rejected. This had been a “startling proposition”. After all, “why would [the defenders] construct a tunnel with no thought to its long-term stability?” In short, the defenders had exercised reasonable skill and care (para [187]). The pursuers’ case had been founded upon hindsight. Even if the pursuers had established liability, they had not proved that class III support, for which they were contending, would have been enough to avoid the collapse. The experts had agreed that only class IV support would have done so.

[113] Clause 82.1 created a stand-alone regime. The defenders had breached this, from August to December 2009, by failing to carry out remedial works. However, because the collapse was an employer’s risk event, this had had a minimal impact on the pursuers’ loss. They would still have required to bear the costs of the recovery project. It did mean, in relation to the counterclaim, that, on the basis of the principle of mutuality, the defenders could not sue the pursuers for a breach of that obligation.

[114] The pursuers had not been contributory negligent in failing to grasp the significance of the odd readings from April 2009. The scheme had been a complex one and, even by August 2009, it had not been in a steady (stable operational) state. Testing was still taking place. It was understandable for the pursuers to have attributed rogue readings to instrumentation errors. The signs had been confusing, with the scheme returning to full

output after each blip. The specialists, Andritz, had observed the odd readings, but had not advised the pursuers of any urgent action required.

Damages

[115] The commercial judge adopted the general principle regarding action taken in an emergency set out in *Banco de Portugal v Waterlow & Sons* 1932 AC 452 (at 506). The costs of the recovery project had been “largely reasonable” (para [200]), taking into account (para [202]) a number of factors, *viz.*: (1) the pursuers had had to act quickly to recover their asset; (2) the pursuers had acted on the advice of professional consultants; (3) BAM, like the defenders, had only been prepared to contract on the basis of reimbursable costs (Option E); (4) the pursuers had instituted an exacting costs monitoring regime involving consultants and auditors; (5) the remedial works had evolved over the course of the recovery project; (6) no one had wished to put the scheme back into operation without being sure that it was fit for purpose; and (7) it was not appropriate to compare the price of the original works with those of the recovery project.

[116] A bypass tunnel (BPT) had been the correct solution, having regard to the uncertainty about the size of the collapse, the extent of the void and the stability of the rock. Tunnelling through would have carried a risk to safety. The BPT had not been placed too far away, nor had it been too long. It had been reasonable to include a Downstream Access Tunnel (DAT), because of the benefits it yielded in relation to ventilation, access and safety. The Health and Safety Executive had insisted on the installation of a concrete invert. This, in any event, had reduced construction time and cost. Although it had not achieved its object of allowing the BPT to be excavated from both ends, it had allowed for the quick removal of

silt and debris and permitted repair of the secondaries without interference to the BPT works.

[117] The defenders had relied on John Hunter to demonstrate the excessive nature of the remedial works, which he had estimated ought to have cost only £30.5 million. However, the commercial judge rejected his evidence as Mr Hunter had, in contrast to the pursuers' experts, failed to appreciate fully the initial uncertainty, the scale and sequencing of the works and the rigour of the pursuers' cost monitoring. Overall, BAM had made a profit of only 2 to 3%. Mr Hunter had accepted that he had placed excessive reliance on the annual costs reference work (Spon's) and on a comparison with a nearby tunnelling project.

[118] The pursuers had not pressed their claim in respect of defects in areas of the tunnel unaffected by the collapse. It was rejected in any event for 4 reasons. First, no such defects had been noticed in 2008. Secondly, after the pursuers had issued a defects notice (D058) in March 2010, which had stated that there was insufficient tunnel support at 31 locations, attempts to identify these in April 2010, by the defenders, Donaldsons, who were the pursuers' consultants on the recovery project, Jacobs and BAM, had all been unsuccessful, although it later transpired that this was because the chainages painted on the tunnel had been incorrect. Once the features had been discovered, the view of the defenders' senior design manager, Thomas Becker, was that they did not look like defects. Thirdly, Prof Broch had inspected the tunnel in January 2011. He had taken the view that what were alleged to be defects were either rock features, which could be left unsupported, or minor rock falls, which were to be expected on a first dewatering. Dr Bodo Billig, the defenders' head of geotechnics, had looked at each defect and had identified 28 as requiring no work and 74 requiring minor works at the first maintenance period. None posed a risk to stability.

[119] The recovery work had been carried out within a reasonable time, other than in relation to the first three months, when productivity had been poor. The report by Mr Fawcett had described the work as progressing “extremely slowly”. A deduction required to be made to reflect this poor productivity (see *infra*).

[120] In terms of the contract, if the scheme failed to achieve certain targets in the two year period after completion, the defenders were bound to pay “low availability damages” to the pursuers for loss of revenue (clause 48.2, Z6). This was subject to a £1 million cap. This amount was awarded to the pursuers, although further submissions were required on whether the £1 million cap applied to the construction of the DAT.

The counterclaim

[121] The defenders’ counterclaimed for £9.6 million. This consisted, first, of loss of profit of £3.1 million, which the defenders would have made, had they carried out the recovery project under clause 82.1 or, in response to the defects notices, clause 43.1. Secondly, there was a claim for £6.5 million, being the costs which they averred that they had incurred in terms of management time and payments to experts, lawyers and consultants in the monitoring of the repair works, the conduct of the adjudications and this litigation. The commercial judge held that any loss of profit suffered by the defenders had been caused by their own breach of the repairing obligation under clause 82.1. Any costs incurred were not due to physical damage to the tunnel.

Conclusions and decrees

[122] The commercial judge summarised (para [260]) his conclusions as follows:

“(a) The contract imposed a duty on [the defenders] to exercise reasonable skill and care in the construction of the scheme.

- (b) [The defenders] had discharged that duty.
- (c) The ground conditions were worse than [the defenders] had observed, however, and the support proved insufficient to prevent the collapse.
- (d) Class IV support was required to prevent the collapse.
- (e) The collapse was not due to a defect that existed at take over. Accordingly, it was an employer's risk event.
- (f) There was no contributory negligence. [The pursuers were] not at fault in respect of the odd readings and the output swings from April to August 2009.
- (g) [The defenders] breached their obligations by not returning to repair the tunnel.
- (h) In consequence, (i) [the pursuers] were entitled to instruct BAM to carry out the recovery project, and (ii) [the defenders] were not entitled to recover any sums in terms of the counterclaim.
- (i) ... the costs of the recovery project [were] reasonable, subject to a deletion of the claims in respect of the "secondary tunnel defects" and the dam bottom culvert [frozen pipe]. [A sum ought to be deducted] to reflect low productivity in the early months of the project.
- (j) [Low availability damages should be awarded to the pursuers]."

[123] Having heard the parties further, the commercial judge held that the defenders were obliged to reimburse the €388,720.27 and £32,357.98, which had been paid in terms of the adjudication awards. The capped amount of £1 million for low availability damages would be awarded in respect of the defenders' breach of clause 82.1. Had the pursuers succeeded, £107,617,830.94 would have been awarded in respect of the recovery project. This consisted of £129,818,563.94 being the sum paid to BAM, plus the pursuers' management time of £1,338,267.76, less deductions of: (a) £533,345.76 in respect of low productivity (although this sum was precisely that for management costs requiring to be deducted from BAM's account according to Mr Hunter); (b) £1,005,655 in respect of disallowed culvert (frozen pipe) repairs; and (c) £22 million in respect of the cost of repairs to the secondaries. Interest at the rate of 4% per annum from the date of citation was awarded as the claim was one for damages and not payment under the contract.

[124] The defenders were entitled to the expenses of the action, because they had substantially “vindicated their position”. A deduction of 5% was made to reflect the success of the pursuers in respect of the adjudication awards, the low availability damages and their successful resistance of the counterclaim. Time had been taken up enquiring into a matter where there had been a lack of candour on the part of the defenders in relation to their true intent in relation to the remedial works

Submissions

Pursuers

Principal Appeal

Overview

[125] The pursuers adopted their written Note of Argument, without exception, but presented an oral submission with a markedly different content. This summary attempts to consolidate the grounds of appeal, the Note and the oral submission. In the Note, the pursuers’ claim was based on three primary grounds: (i) a failure to correct defects (clauses 43, 45 and 46); (ii) a failure to replace or repair loss and damage (clause 82.1); and (iii) an indemnity for a contractor’s risk (clause 83.1). The parties were agreed on record that the defenders had been contractually obliged to correct defects. If there was a defect, the next issue was how the contract allocated responsibility for it.

[126] In their oral submission, the pursuers’ central contention was that, despite the presence of several “rabbit holes”, there was a clear route governing liability. The pursuers had alternative cases. The first (ground of appeal 1) was that the commercial judge had erred in his approach to the provisions on defect correction, by regarding Option M as

overarching. Secondly (ground 8), if Option M operated as a brake on liability, the judge had erred in holding that the defenders had discharged the onus of proof.

[127] The facts could be stated in eight propositions: (1) the tunnel had been procured to provide reliable service for 75 years; (2) the collapse had been due to a failure to provide enough support and had been caused by erosion, which was a hazard highlighted in Table 11; (3) there was no evidence that those who had designed and installed the support had considered Table 11; (4) erosion had been observed prior to watering up, but had been carried over to the first maintenance inspection; (5) there was no evidence that measures to counter that erosion had been considered; (6) the obligation on the defenders had been to provide the works. The defenders had an obligation to inspect and to correct any defects at their own cost for at least two years after take over (completion); (7) the defenders had refused to correct them at their own cost; and (8) given that breach, the defenders were liable to pay damages of at least £107 million, or £126 million if the pursuers' argument about the secondaries were correct. If the court agreed with these eight propositions, liability followed and there was no need to consider the rabbit holes of: (i) causation; (ii) contributory negligence/fault; (iii) joint insurance; and (iv) Option M.

[128] The contractual structure could be described in five propositions: (1) the defenders were obliged to correct all defects; (2) the source of the obligation was in clauses 20.1 and 43.1; (3) there was an express provision that, if the defenders failed to correct a defect, the pursuers could engage another to do so and recover the costs (clauses 45.1 and 46.4); (4) the obligation under clause 43.1 subsisted until the defects date, which was two years after completion. There was no distinction in the contract between the position prior to take over, in December 2008, and the ensuing two years. If the tunnel, on inspection within the two year period, was not performing satisfactorily, it was for the defenders to remedy that, at

their cost; and (5) the defenders had used Option M not just as a limitation on liability, but as a means to create a right to carry out the work and to be paid for it.

Option M and defects (Ground 1)

[129] The commercial judge erred (at para [260(a)]) in his interpretation of the contract, and in particular Option M. Clauses 20.1, 40.4, 43.1, 45.1, 46.4, 60.1 and 80.1 obliged the defenders, at their expense, to correct any defect, irrespective of whether it had been caused by a failure to exercise reasonable skill and care. The judge had not considered clause 20 or section 4. He had found that there was an obligation on the defenders only to exercise reasonable skill and care in the design of the scheme, but that was not what the contract said. The proper starting point was to ask whether there was a defect. If the answer to that was no, then whether reasonable skill and care had been exercised was irrelevant. The pursuers attached to Option M the same interpretation as was given in the Guidance Notes to NEC2 (1995).

[130] The contract was arranged in such a way that the actions of the parties were defined precisely (Guidance Notes, "Clarity and Simplicity"). The basic obligation on the contractor was to provide the works (clause 20.1). This included testing and making good defects (Guidance Notes, on clause 20.1). The issue of the defects certificate signified the end of most of the obligations. There was unlimited liability for defects specified in the certificate; ie those identified in the first two years. There was then a limitation on liability for defects which had not been identified; ie latent defects emerging after two years. The Guidance Notes said (para 21.5) that the contractor's liability could be limited to an amount stated in the contract data or by the inclusion of Option M. Option M was thus dealing with a limitation on compensation. The limitation applied only after the issue of the defects

certificate (*ibid*, under reference to clause 43.2). The contractor's liability to compensate, rather than to correct, applied only after the issue of the certificate.

[131] Loss and damage occurring after take over, except in so far as relating to a prior existing defect, was an employer's risk. The point of take over was significant in terms of section 8, which dealt with indemnity and insurance; but take over had no relevance to section 4, because the obligation to correct was the same before and after take over.

Clause 40.4 provided that, if a test or inspection showed a defect, the contractor had to correct it and repeat the test. The defects date was 104 weeks after completion. The contractor had to attend an inspection within the final four weeks.

[132] On Option M: (1) there was a distinction between compensating and providing or completing the works; (2) Option M qualified the liability to pay compensation, but not the obligation to provide or to complete the works; (3) the contract spelled out the actions which were required and their financial consequences. In the period down to the defects date, if the contractor did not do the work, the costs could be recovered from him (clause 45.1). Clause 46.4 extended the period to 12 years; (4) recognising Option M as a defence to a failure to correct defects was to turn the provisions in section 4 on their head; (5) the pursuers' meaning was the one given in the Guidance Notes and was consistent with the pragmatic analysis in *CRS (supra)*; (6) where there was to be additional payment for work, the contract said so expressly (clause 60.1). It was a shield and not a sword. It was a defence to liability and not an entitlement to payment; and (7) there were express extensions to the employer's risk at clause 80.1.

A defect at take over (Ground 2)

[133] The commercial judge erred (para [260(e)]) in holding that a defect had not existed at

take over. His findings (paras [147] and [152]) showed that there had been a defect, as defined in clause 11.2(15), at take over. On 6 August 2009, the pursuers had issued defects notice D053, stating that the support to the tunnel appeared to be inadequate. Eight years later, the Lord Ordinary concluded that that was correct. An instruction had been issued on 31 August 2009, asking the defenders to proceed with the remedial works. They refused and were therefore in breach of contract.

[134] The commercial judge had addressed section 8, by asking whether there had been a defect at take over. He had not addressed the route 1 argument based on clause 20.1 and section 4. The judge held that the brake, that was engaged by Option M, meant that there was no defect in the first place. The correct approach was to ask: first, whether there was any defect at all; secondly, when it came into existence; and, thirdly, how the contract addressed the defect? In terms of clauses 80.1 and 81.1, loss and damage occurring before the defects certificate, which was due to a defect which existed at take over, was a contractor's risk.

[135] The commercial judge found that the cause of the collapse was the absence of adequate support. The HRT was therefore not going to give reliable service. There was a failure to meet that standard. Similarly, and more specifically, the erosion and the slaking meant that there was potential instability, and for that reason also the HRT was not going to provide reliable service. The HRT thus failed to meet the requirements of the works information. Insufficiency of support, as at take over on 18 December 2008, was a defect. If the collapse was classified as loss and damage, as distinct from a defect, it was still a contractor's risk.

[136] The parties were agreed that the contract between them was a fitness for purpose contract with an exception; that being Option M. Option M was a limitation of liability

clause. It did not reduce the scope of the work or alter its nature. During the period up to the defects date, the employer could ascertain whether the design was adequate for the design period. For an unlined tunnel, that required the employer to put the tunnel into operation in order to try it out. When the tunnel had been subjected to testing on a trial and error basis, it had failed.

[137] At take over, there was an expectation that the outstanding defects notice would be dealt with under clause 43. Defects notice D041 said that voids in the invert were to be filled with concrete and remedial action was to be taken during the first dewatering. This indicated that there was a section 4 defect at take over, namely that erodible material had not been protected, in breach of the contractor's design. It was also a breach of the works information, as the support had not been adequate.

[138] The requirement to design a tunnel to last for a period of 75 years had not been qualified by Schedule Part 7. The defenders had not led any evidence that some other period had been agreed. If the pursuers had inspected the tunnel in May 2010, and observed cracking which was consistent with a threat to stability, they would have concluded that the tunnel would not last 75 years. The question was not whether, in the abstract, the tunnel had been designed to last 75 years, but rather whether at the point of the defects inspection, it would be likely to last that period.

[139] If the support in the tunnel required to be upgraded (ie class III rather than II) the contractor would be paid for the increase in the level of support. The parties anticipated periodic payments up until, and beyond, the completion date; the long stop being the defects date in December 2010. A change in the percentage length of each class of support would constitute a compensation event under clause 60.1(12), regardless of when the variation occurred or the circumstances giving rise to the variation. The contractor was not

paid to correct a defect. An increase in the level of support was not regarded as the defect, but rather as a change in design.

An event (Ground 3)

[140] The pre-watering up inspections were an event within the meaning of clause 80.1. The collapse was due to the failure properly to address the risk of erosion that was observed in certain sections of the tunnel. The collapse was accordingly a contractor's risk. The commercial judge had not considered this.

Option M reprise (Ground 4)

[141] The Lord Ordinary had given Option M too wide an interpretation. It only applied to defects caused by the failure of the contractor's design. It did not apply to a defect attributable to a failure to implement that design. The design, if properly implemented, would have resulted in the installation of class IV support. There had been a failure in that regard. A failure to comply with Table 11 was not a defect in the design. The design included Table 11.

Onus of proof (Ground 8)

[142] The commercial judge had erred (paras [157-8]) in holding that the defenders had discharged the onus of proof stipulated in Option M. The defenders' chief decision-maker, Mr Taylor, had not given evidence. The defenders had lost contact with Mr Taylor. The pursuers had been in contact with him, but he could not speak to them because of a confidentiality agreement. A standoff had ensued. Several others, who had been involved in the tunnel, had not given evidence. Jacobs' geologists had not been called, nor had their contract supervisors. The author of Pöyry's RSM had not given evidence, nor had those

who had signed the REC sheets. None of those who had taken any of the decisions on the level of support had been called. Instead, a number of experts had been asked to look at documents, with a view to telling the court what their authors had seen, thought or done.

[143] Although, when all the evidence was out, onus seldom mattered (*Salt International v Scottish Ministers* 2016 SLT 82 at para [45]), there remained situations in which it was a determining factor (*AW v Greater Glasgow Health Board* [2017] CSIH 58 at para [57]; *Armstrong v Glasgow City Council* [2017] CSIH 56; *Stephens v Cannon* [2005] CP Rep 31, under reference to *Rhesa Shipping Co v Edmunds* (“*The Popi M*”) [1985] 1 WLR 948; *McEwan v Lothian Buses* [2014] CSIH 12 at para [19]).

[144] It was not known what those, who had made the relevant entries in the REC sheets, had understood by “erosion”. It was not known whether they had considered Table 11. The REC sheets, which had been used for the HRT and the TRT, had been identical to one another, except for the header and footer. It was not known what the individuals looking at the REC sheets had been thinking about when they had been taking decisions in the HRT as opposed to the TRT.

[145] There were two shears with a gradient of 50° marked on the mapping for one section (chainages 2125-2100) of the blocked zone (2121-2050). In terms of the RSM, this required class III or IV support. On the equivalent REC sheet (2117-2101), there was a record of kakirite, which also required class IV support. It was not known why class III and IV support had not been installed. In the absence of the decision takers, the court could not know what factors had been considered (*Hills v Niksun Inc* [2016] IRLR 715).

Reasonable skill and care (Grounds 5, 9 and 10)

[146] The commercial judge made a significant number of errors of fact. He stated

(paras [180]-181]) that none of the experienced tunnelers had seen any signs of a fault that might have threatened tunnel stability. None had recommended the installation of a higher level of support. That was wrong. At chainages 2990 to 2895, which had been described as the “big bad zone”, multiple shears had been noted. Pöyry had raised the need to apply shotcrete to erodible zones, independent of the rock classification. In January 2008 they had proposed that they return to confirm that the design requirements had been understood. They had recommended the installation of 360° support in areas (chainages 2117-2107) where erosion had been observed. The judge found that Pöyry had inspected the tunnel on a metre by metre basis in 2008. In fact, only certain parts, and not the CFZ, had been inspected. They had not examined the collapsed zone (2121 to 2050). The part of the tunnel, where additional support had been required, involved rock conditions of a similar nature to the collapsed area. The failure to inspect the CFZ had been, in the words of Dr Palmström, a “missed opportunity”.

[147] The commercial judge, in stating that there had only been minor issues, which had been resolved prior to watering up, had been thinking of defects notice D033 in June 2008. He had forgotten about defects notice D041 of 10 November 2008. In that, the pursuers had recorded significant voids below the tunnel invert, where weak and/or sheared rock had been eroded. There was erodible rock at a number of locations on the lower side wall. The pursuers had been concerned about material in the lower part of the tunnel deteriorating. The decision to leave this section exposed had been inconsistent with the Pöyry recommendation.

[148] The critical words in the RSM were the references to fault zones with erodible kakirite and a shear with a dip of <50° angle to the horizontal. The mapping (chainages 2117 to 2101) had showed a shear of <50°; so the area required class IV support. The REC sheets

showed the presence of kakirite and shear zones with quartz mica schist. The overall support category was inexplicably assessed at class IIA. Those on the ground may not have complied with Table 11 because the REC sheet template did not remind them to do so.

There was a *prima facie* case, based on a combination of the mapping and the REC sheets, that class IV support ought to have been installed.

[149] The parties had originally believed that the CFZ was between chainages 2075 and 1960 and not between 2117 and 2101. The email from Mr Taylor, dated 24 August 2007, had suggested that the CFZ was between chainages 2070 and 1960. The TBM crew engineer had received an email from Jacobs dated 18 July 2007, stating that the CFZ was anticipated between chainages 1850 and 2200. This differed from Mr Taylor's email. Both Mr Taylor and Jacobs had been signatories to the REC sheet for chainages 2117 to 2101. There was a conflict about where the CFZ was. The RSM had depicted the CFZ at chainage 2000. It had been anticipated that there would be large continuous areas of disturbed rock, but this was not what was noted. Rather, there were veins of faulting, interspersed with good rock. That was the pattern which Dr Wilhelm had ultimately recognised. Table 11 contained the reference to the hazard of erosion during operation. This criterion had not been contained within the REC sheets. If the sheets were to be the sole guide to long-term support, they ought to have contained all the criteria, including those in Table 11. The commercial judge had made no finding that any engineer had considered the content of Table 11 as part of any holistic exercise.

[150] The defenders had failed to prove reasonable skill and care because: (1) the REC sheets for the HRT did not refer to Table 11; (2) no witnesses mentioned Table 11 as a consideration; (3) the defenders had put forward contradictory positions in relation to

Table 11, including the proposition that it did not relate to the protection of erodible rock; and (4) the REC sheets dealt only with excavation and not the second phase of operation.

[151] According to Prof Broch at the Adjudication, the REC sheets simply identified the support to be used when the tunnel was being excavated. After that, someone would come along and make a decision about the long-term support. If that were so, Table 11 was not relevant to the first phase of the work. The commercial judge considered only what individuals may have seen. He overlooked the evidence that the TBM crew and others may not have appreciated what they were looking at.

[152] The commercial judge had failed to take into account that there was a two stage process at which the REC sheets were completed. There was the initial excavation, followed by a consideration of operational matters. Prof Stille noted that it would not be unusual to take one approach to the excavation of the tunnel and another to the permanent support. The RSM considered rock stability during excavation. It did not consider stability in conditions of hydraulic load. That was why Pöyry had returned to inspect the tunnel and consider erosion. In the absence of evidence that Table 11 and the erosion in the invert had been considered properly, negligence was established.

[153] Jacobs had specifically asked the defenders to clarify what had been meant by “erodible” in the RSM, but the defenders had not done so. The commercial judge had failed to conclude that constructing tunnels, in the absence of a proper definition of an acknowledged hazard, was not consistent with the exercise of reasonable skill and care. The experts were agreed that erodible rock was present in the HRT. The judge failed to give adequate reasons about reasonable skill and care based upon his own rhetorical question: “Why go to the bother (*sic*) of identifying such features and then decide to do nothing about them?”

Risk and indemnity (No ground)

[154] The pursuers advanced indemnity as an alternative route (1A) to success. In terms of clause 82, the defenders were required to replace and repair loss and damage. Clause 83 provided an indemnity in respect of the costs. The two routes ended up at the same point; a damages claim for the refusal to carry out remedial work, and the indemnity. When there was loss and damage attributable to a defect which existed at take over, that was a contractor's risk, whether or not, in terms of that clause, the contractor was obliged to correct it. Clause 83 provided an indemnity, depending on whether the event was a contractor's or an employer's risk. Option M did not convert what would otherwise be a contractor's risk into an employer's risk.

[155] The joint insurance only applied to contractor's risks (clause 84.2). If the defenders were correct, the use of reasonable care would not only result in an indemnity in their favour, but the event would also fall outwith the scope of the insurance. If the pursuers were correct, the provisions worked in a sensible way. First, the contractor would do the work straight away. If it was a contractor's risk, both parties would have access to the insurance monies to fund the works. The insurance claim was expected to yield a maximum of £27 million.

Inadequacy of reasons (Ground 6)

[156] The commercial judge's reasoning was short and omitted discussion of key legal and factual disputes. The judge required to address the principle issues of law and fact (*Dingley v Chief Constable, Strathclyde Police* 1998 SC 548 at 554 to 556; *McLeod's Legal Representative v Highland Health Board* 2016 SC 647 at paras 91-96). The parties had required to spend a significant length of time going through the evidence at the hearing of the reclaiming

motion, which highlighted that the judge's reasoning was deficient. The judge ought to have recorded the principal evidence upon which he relied. An opinion should make clear the basis upon which facts have been found. When a finding had been made on disputed evidence, the opinion ought to explain the basis for that. The judge's Opinion was stripped back and bereft of the critical evidence. Only if adequate reasons had been given, could the question, of whether the court of first instance had been "plainly wrong", be answered. An appellate court could interfere with factual conclusions if there has been a demonstrable failure to consider relevant evidence (*Henderson v Foxworth Investments* 2014 SC (UKSC) 203 at para 67). The judge had failed to give adequate reasons for his central findings.

Reliance on documents not spoken to (Ground 7)

[157] The joint minute had agreed that certain documents were what they bore to be, but that did not mean that their contents could be taken as true and accurate (*McEwan v Lothian Buses (supra)* para 3). The commercial judge erred in proceeding on the assumption that the REC sheets and the mapping were true and accurate. He wrongly took into account the conclusions of two documents, which had not been spoken to by their authors *viz.*: the minutes of the meeting noted by Mr Speirs; and the report by Mr Fawcett. The person to whom this report had been put (the pursuers' later project manager) had disagreed with it. Dr Wilhelm's evidence, that the mapping showed the criss-crossing of the shears and thus the mechanism of the collapse, went without comment by the judge. Instead, he used the conclusions of a witness who had not given evidence.

[158] An expert could not give evidence on what specific terms marked on the REC sheets meant, or what factors were taken into account in making the notations. The defenders had been unable to elicit the evidence, which they required to do, because the pursuers had not

called the witnesses to speak to the documents. There were numerous examples of witness testimony contradicting the documents. Where a whole raft of witnesses had, without explanation, not been called, it was inappropriate to ask experts to give the primary evidence.

Causation (Ground 11)

[159] The commercial judge's conclusion about causation was irrelevant. There was no requirement to prove that the exercise of reasonable care would have led to the installation of a particular type of support, which would have prevented the collapse. If the collapse had been due to a defect, which the defenders were obliged to repair, there was no need to prove causation. If the collapse was a contractor's risk, then the pursuers were entitled to the indemnity under clause 83.1. The defenders were liable irrespective of causation. If the pursuers required to prove causation, they had done so.

Secondaries (Ground 12)

[160] The commercial judge had erred in holding that the secondaries were not defects. Donaldsons had drawn up a list of 114 areas where erosion had occurred. Jacobs had recommended that there be extensive work done in these areas. The judge had excluded the cost of this work, which was about £21 million, from the damages calculation.

[161] Caution was a factor which could be taken into account in determining what was reasonable (see *Governors of the Hospitals for Sick Children v McLaughlin & Harvey* [1987] 19 Con LR 25 at 105). Whether the secondaries were a defect in their own right was immaterial. Having had to carry out extensive repair work, the defenders had to be prudent and eliminate the risk of erosion elsewhere. Dr Billig had conceded that 65% of the secondaries required remedial attention. If this work required to be done, then the cause

constituted a defect. Dr Billig had referred to 74 of the 114 secondary features being those which he would have expected to occur following a first dewatering. Although they posed no immediate risk to stability, they ought to have been, and were, dealt with in order to avoid any future risk.

Clause 82.1 damages (Ground 13)

[162] The commercial judge had erred in not awarding the pursuers greater damages in respect of the defenders' breach of clause 82.1. If the defenders had been obliged to carry out repairs at their own expense, the pursuers were entitled to the full cost of those repairs as damages. The measure of damages was the difference between the costs incurred and the sum which would have been paid to the defenders had they carried out the repairs. The judge erred in holding that there was no evidence on this matter. The defenders' evidence was that the sum which they would have claimed was £28,729,000, plus a profit of £3,102,470. The total was the amount that ought to have been deducted from the total paid to BAM in computing the damages. It was accepted that the weakness in this argument was that the evidence from Mr Hunter concerning the £31 million had been discredited.

Expenses (Ground 14)

[163] The commercial judge had erred by awarding the defenders 95% of their expenses. There was no rational explanation for this and, in particular, for isolating the evidence about the defenders' lack of intention to repair the works as the sole matter justifying a discount. The defenders had been unsuccessful on a number of other issues, including: (a) the counterclaim; (b) the allegation that the pursuers were in breach by failing to give the defenders an opportunity to carry out the repairs; (c) contributory negligence; (d) the reasonableness of the remedial works; and (e) the quantification. About 40% of the proof

had been occupied by issues on which the defenders had been unsuccessful. But for these issues having been raised, the proof could have been concluded in one court term. The relevant principles were set out in *William Nimmo & Co v Russell Construction Co (No. 2)* 1997 SLT 122. The judge was “plainly wrong”. The pursuers had suggested an allocation of 50/50 on the basis that the defenders had succeeded in their defence on fairly narrow grounds. It could have been put much more shortly.

Conclusion

[164] Accordingly, the reclaiming motion ought to be allowed and decree pronounced either for £125,963,845.56, being the repair costs less amounts for inefficient working and the repair of the culvert, or a sum which would be £22 million less in respect of the secondaries. Paragraph 3 of the commercial judge’s interlocutor of 2 February 2017 should be recalled. The court should sustain the pursuers’ second, third, fourth and fifth pleas-in-law, with the fourth being confined to the first conclusion.

Cross Appeal

Joint insurance (Ground 1)

[165] On the assumption that the event was a contractor’s risk and thus covered by insurance, the authorities (*CRS (supra)*) established that, where joint insurance excluded claims between the parties following an insured event, it did not exclude liability for breach of a distinct obligation to repair the damage caused (see also the “*Ocean Victory*” (*supra*)). The existence of an all risks policy was not an answer to a refusal by a contracting party to carry out his obligations. The defenders’ breach in refusing to carry out repairs was not an insured risk. The duty under the contract was to correct and not to compensate (*CRS (supra)* at para 6). The balance between the parties in *CRS* could be found in the present contract.

The pursuers stood to lose £20 million per year as a result of the tunnel collapse, because the contract generally excluded claims for consequential losses. The contractor took the risk of a defect occurring, but his liability was limited to the low availability sum. The employer would have no claim for compensation, but he could insist that the contractor carry out repair work (*CRS (supra)*, at paras 48 and 73).

[166] Joint insurance was irrelevant to a claim based on a breach of the obligation to correct a defect. There was a distinction between a contractual scheme, which curtailed recovery irrespective of the cause of the loss, and a contractual provision which backed up other obligations enforceable against the other party by other means. The joint insurance in the "*Ocean Victory*" had been comprehensive, exclusive and applied irrespective of the cause of the loss (*ibid* para 114). That was not the position in this case. The parties had anticipated a shortfall (clause 85.4) to be allocated to the party on risk. The defenders' interpretation read a qualification into clause 85.4 which was not there.

[167] The contract clauses were of a different nature to those in the "*Ocean Victory*" (*supra*). The remedies under the contract were not exclusive. The defenders' approach attempted to qualify the indemnity in clause 83, by reading into it that a contractor's risk would not be included because of the existence of joint insurance. The insurance provision was intended to support obligations which remained enforceable. The insurance provision provided a supplementary fund, akin to that in *Surrey Heath BC v Lovell Construction* (1990) 48 BLR 108 (at 121).

Clause 82.1 (Ground 2)

[168] The commercial judge had correctly construed clause 82.1. The defenders were not entitled to refuse to carry out the remedial works until they had been paid, or payment was

agreed, if they considered that the collapse was *prima facie* an employer's risk event. The purpose of clause 82.1 was to secure the prompt repair of damage, not to delay the works until any dispute were resolved (*Thomas, Keating on NEC3* at para 9-019). The contractor would bear the initial financial outlay. The adjudication clause (clause 92) provided that, pending the resolution of the dispute, the parties were bound by the instructions given.

[169] The pursuers had not been in breach of their obligations in issuing an ultimatum to the defenders, nor was there a break in the causal chain between the defenders' breach and the loss. It was only after the defenders had given the impression, that they did not intend to carry out the works, that the pursuers began to explore the possibility of having someone else carry it out. Had the defenders not breached their obligation, no ultimatum would have been issued.

Counterclaim (Ground 3)

[170] The commercial judge was correct to reject the counterclaim on the principle of mutuality. Caution should be exercised when artificially dividing up obligations (*Inveresk v Tullis Russell* 2010 SC (UKSC) 106, at para 43). Had the defenders carried out the recovery project, the pursuers would have paid them, had the collapse been an employer's risk event. When the defenders refused to carry out the works, the pursuers had paid BAM. Since the defenders were in breach of clause 82.1, they could not claim the costs of shadowing somebody else who was performing what was their own obligation. This applied to both loss of profits and the monitoring of the remedial works. For the litigation and adjudication costs, it was not possible to predict what the dispute would have been between the parties, had the defenders not breached clause 82.1.

[171] The causal chain between the defenders' loss and the collapse of the HRT had been broken by the pursuers instructing BAM and by the defenders' decisions to shadow the remedial works, to adjudicate twice, and to conduct this litigation. These were all voluntary commercial decisions which were not the direct and natural consequence of the collapse. The collapse required to be the effective cause (*ENE Kos I v Petroleo Brasileiro (No. 2)* [2012] 2 AC 164, at para 12).

[172] The defenders had not proved *quantum* of their loss. They were not entitled to rely on the evidence of Mr Hunter. The commercial judge found him unreliable. The defenders had failed to prove that the £9 million claimed was reasonable or was causally related to carrying out any work.

Adjudication award (Ground 4)

[173] There was an automatic right to be refunded an adjudication award, if the original payer was successful in a subsequent litigation (*Aspect Contracts v Higgins Construction* [2015] 1 WLR 2961, at para 23-24, 32). The commercial judge was correct in holding that, having determined that no sums fell due to be paid under the counterclaim, the pursuers were entitled to repayment of the adjudication awards.

Low availability damages (Ground 5)

[174] There was evidence of a period of delay due to the defenders' refusal to carry out the investigations. Had the defenders acted properly, the investigations would have been finished by mid-December 2009, whereas they had not even commenced until then. The defenders were not entitled to claim under the indemnity, as the principle of mutuality meant that they could not recover what had been caused by their own breach.

Quantum: The relevant starting point (Ground 7)

[175] The commercial judge proceeded on the agreed basis that he would deal with *quantum* on a headline basis. Thereafter the defenders had declined to participate in any discussion. The parties had been asked to agree the level of costs, but agreement not been possible. The parties' experts had met to identify costs. Disputed costs had been set out in a joint statement. The judge had deducted the sum of disputed costs (approx. £533,000) from the total which he would have awarded.

[176] The pursuers had proved the case to the requisite standard, taking into account that the parties had engaged in a proof to identify the key issues of principle. The commercial judge was entitled to take a top down approach to *quantum*, having rejected the evidence of Mr Hunter, which proposed the opposite. The judge required to look at the reasonableness of the repair work, which was what he did. *Axa Insurance UK v Cunningham Lindsey United Kingdom* [2007] EWHC 3023 was distinguishable.

Downstream access tunnel (Ground 8)

[177] The DAT had not only been an acceleration measure. It had also brought benefits in terms of ventilation, access and safety. There had been a duty on the pursuers to mitigate their loss by repairing the tunnel as soon as possible, even if an early repair would cost more (*Governors of the Hospitals for Sick Children v McLaughlin & Harvey (supra)*). The issue did not require to be determined, given that it was incorrect to describe the sole purpose of constructing the DAT as mitigating loss of profit. The ability to clear the full 600-metre tail of the collapse did accelerate the works, despite the fact that it did not shorten the time to build the BPT by allowing drilling from both ends. The reasonableness of the works had to

be assessed by reference to the circumstances prevailing at the time and not with the benefit of hindsight (*Shepherd Homes v Encia Remediation* (2007) 110 Con LR 90, at para 478).

Operation of the scheme (Ground 9)

[178] The commercial judge had erred: (1) in finding that the signal for needle valve opening had not been transmitted to the control room in Perth; and (2) in addressing contributory negligence, but not “fault” under clause 80.1. Whether “fault” was a higher or lower standard than negligence was irrelevant. For there to be fault, the defenders required to point to a contractual duty incumbent on the pursuers to complete the operational notes (clause 83.2). Fault was different from “default” (cf *City of Manchester v Fram Gerrard* (1974) 6 BLR 70). A breach of duty involved some form of legal obligation (Norrie: “Fault” in *Stair Memorial Encyclopaedia*, Vol 5, paras 252-254).

[179] There was no duty on the pursuers to prepare operational notes and therefore no fault in failing to do so. The responsibility for giving the pursuers the relevant information lay with the defenders. They had provided 52 lever arch files; none of which had contained any entry relating to needle valve opening. The purpose of the operational notes had been to distil the key matters that the pursuers’ operators might need. The pursuers’ employee, namely Claire McConnell, who had been asked to prepare the notes, would have had to have shown more insight than the defenders in order to discern that the valve readings ought to have been included and that the readings observed by the defenders’ subcontractors, Andritz, had required immediate action to shut down the plant.

[180] The defenders’ argument proceeded on the false assumption that, had they been asked, Andritz would have told the pursuers something that would have caused them to take action by 7 May 2009. During testing on 4 May 2009, Andritz had observed a needle

valve opening of 86% and had done nothing about it. The commercial judge found that the pursuers should be excused for failing to notice that the needle valve opening reading was 86%, because of the chaotic conditions. The tunnel was not in a “steady state” of operation during the testing. It was understandable for the pursuers to attribute rogue observations to instrumentation errors.

[181] There was no basis to find that, if the problem had been discovered by 8 May, the cost of the recovery work would have been only £5 million. That figure was premised on assumptions which were rejected by the commercial judge. It assumed that it would have been possible to tunnel through, if the collapse had been smaller. Even Prof Broch and Dr Palmström had accepted that a BPT had been reasonable. The possibility of tunnelling through failed to take into account the dangers in doing so. It presupposed that the collapse in the crown of the tunnel was only 8 to 10m, whereas the judge found that it was somewhere between 10 and 71m long.

[182] The commercial judge rejected Mr Hunter’s evidence, partly because he had assumed too much certainty. Mr Hunter did not have the relevant expertise. The judge rejected his methodology for calculating that the remedial works would have cost only £7.5 million in August 2009. He had used the same methodology to arrive at the sum of £5 million as an estimate for the works in May 2009, based on Dr Büchi’s best guess.

Defenders

Principal Appeal

Overview

[183] The defenders maintained that there was no merit in the pursuers’ construction of Option M (grounds of appeal 1 and 2).

[184] First, the words required to be given their ordinary meaning. “Not liable for defects” referred to the liability to correct defects under sections 4 and 8. Option M turned the contract into one where there was no liability for design, if reasonable skill and care were exercised. Section 4 made the fitness for purpose character of the original contract plain. The onerous nature of that was accentuated by the addition of the 12 year defects liability period; hence the need for, and the purpose of, Option M. Option M stated that the contractor was not liable for certain defects; not that he was not liable for compensation due to defects arising after the 12 year latent defects period. If Option M was a limitation arising only after the end of the latent defects period, it was meaningless. There was no liability of any kind after that (clause 46.5).

[185] Secondly (ground 4), the choice of what support to install had been part of the design. It was a holistic exercise of judgment, taking account of the observed conditions. It was part of the process set out in the contractor’s design and accepted by the project manager. The judgments were evidenced by the REC sheets, which were referred to within the accepted design documents.

[186] Thirdly, on onus of proof (grounds 5 to 10), the pursuers’ general complaint, that the defenders had not called the necessary witnesses, was bound to fail. It was only an exceptional case that ought to be determined on the basis of onus. The commercial judge had heard a wealth of evidence on which he was entitled to reach his findings in fact. At the forefront was the finding that all the design decisions taken in the tunnel had been approved by Jacobs. This finding impacted on many different aspects of the case, including the pursuers’ ability to establish a defect in design, onus and reasonable skill and care. The judge’s reasons (ground 6) were adequate.

Option M and defects (Ground 1)

[187] The contractual analysis should not be based simply on the documents, but on the evidence about what everyone had done. The accepted design referred to a process. The meaning of design was informed by the evidence which explained the working of the process at each stage. The commercial judge had correctly understood the contractual and design documents in light of the evidence.

[188] The responsibility for the design rested with the defenders (clause 14). An essential element of design was choice (Hudson: *Building and Engineering Contracts* (13th ed), at para 378). The project manager had accepted not merely a document, but a process. If everything that happened in the tunnel were left out of the equation, and the design were simply what was contained in the documents, all that would exist would be the drawing D201 and the RSM. These simply provided a menu of options.

[189] This was a re-measurement contract. If there were an increase in the class of support, the contractor would be paid for that. If the re-measurement was less than the total estimate of £129m, less would be payable. There had been no incentive on the defenders to provide less support. There was an economic benefit to the pursuers in decreasing it.

[190] The project manager had certified the tunnel as complete for safe operation in December 2008. The design was accepted by this process. The contractor had done all that the works information had required by the completion date. Defects under section 4 were shortcomings; loss and damage under section 8 in contrast were fortuitous. There were separate regimes for each aspect.

[191] In describing both the obligation to correct defects and the obligation to pay for correction, the word “liable” was used. It was the same word as that used in Option M. In the case of latent defects, the contractor submitted proposals to remedy the defect. If the

contractor failed to remedy the work, the contractor was “liable” for the costs of employing another. On the pursuers’ version, there was a period during which both regimes would operate. The pursuers’ suggestion that Option M limited liability beyond the latent defects period was not well-founded, since there was no liability at all at that stage.

[192] If an upgrade were required, that amounted to a defect; a defect in design being something that was not in accordance with what ought to have been proposed. If, following dewatering, a defect had been detected, the obligation to correct it would continue, subject to Option M. If what had been installed was class IIA, and it should have been class III, that was a defect.

[193] Section 8 dealt with risks and insurance. This was a different regime from defect correction. Loss and damage after take over was an employer’s risk, unless it was due to a defect which existed at take over. There was no such defect and, in any event, Option M operated to exclude liability. The pursuers were treating them as alternative routes to arrive at the same conclusion, but they were not the same. The commercial judge would have awarded loss and damage and not the cost of correcting a defect.

[194] The heading to Option M in the NEC contract was “Limitation of the contractor’s liability for his design to reasonable skill and care”. There was no reference to defects. The standard form was intended to be suitable for parties entering into a design and build contract. It was unsurprising that Option M was the clause which achieved its object as part of a standard menu. It was not possible to get anything simpler than a statement that the contractor was not liable for defects. Option M took priority over section 4 because the standard form already contained section 4. The drafters had provided an easy way of converting the contract for the purpose of design, rather than construction; the latter remaining on a fitness for purpose basis.

[195] The alternative construction denuded Option M of any real purpose in a design situation, unless a contractor was prepared to accept that the contract remained one of fitness for purpose. The effect of Option M was that it cut through section 4. The exception in clause 80.1 tied sections 4 and 8 together. Loss and damage to the works taken over by the employer would be an employer's risk, except where it was due to a defect which existed at take over. The contractor was not liable for loss and damage due to defects which existed at take over, where the defect was non-negligent.

A defect at take over (Ground 2)

[196] The onus of proving that a defect existed remained with the pursuers. The fact that a design life had been stipulated did not mean that the life of the works was guaranteed (*MT Højgaard v E.ON Climate & Renewables UK Robin Rigg East* [2017] Bus LR 1610, paras 6, 27-32, 44-45). It would have to be demonstrated that what had been done in design terms could not, or was not going to, produce a scheme which would function for that period. That was not the case here. In any event, the 75 year period had been varied in terms of Schedule Part 7, para 6, which applied it only to concrete structures. The tunnel was not such a structure. There was no design life for the civil works in general. The commercial judge had erred in holding that there was a design life of 75 years.

An event (Ground 3)

[197] The pursuers' attempt to classify the pre-watering up inspections as an "event" was contrived. The inspections were part of the works. They were not contractually significant, unless it could be demonstrated that they involved a defect.

Option M reprise (Ground 4)

[198] Even if it was accepted that the design was not a process but the content of documents, the latter said only that support was to be installed to the extent required to meet the conditions encountered. The judge found that the defenders had installed that support. There was no disconformity between such implementation as the design required and the implementation which was carried out. If what had been decided in the tunnel were not part of the design in contractual terms, it was in practical terms. Option M limited liability for all design, not simply design which had been accepted in terms of the contract.

[199] Everyone knew that they were contracting for an unlined tunnel using the observational method and that a risk remained. The pursuers had tried to make the contract work by engaging with one of the world's top contractors, namely the defenders, and one of the world's top consultants, that is Jacobs. The risk remained but it could not fall upon a party who could only do what was agreed in light of what could be observed.

Onus of proof (Ground 8)

[200] Once evidence had been heard, questions of onus rarely arose (*Salt International v Scottish Ministers* 2016 SLT 82, paras [45]-[49]). Cases which fell to be decided upon onus had to be exceptional ("*The Popi M*" (*supra*); *Dingley v Chief Constable, Strathclyde Police* (*supra*); *Stephens v Cannon* [2005] CP Rep 31, para 46).

[201] The pursuers' complaint ignored the significant body of evidence to which the commercial judge had regard. The judge gave (para [174]-[177]) four reasons, which formed the basis for his conclusion that reasonable skill and care had been exercised. None of the experts, with the exception of Prof Sloan, had been prepared to impugn the decisions taken in the tunnel. The judge had seen the primary evidence of mapping and the REC sheets. He

had heard the testimony of what others had made of this. He rejected (para [187]) the pursuers' contention that the defenders had not exercised reasonable skill and care on the basis that it had been founded upon hindsight. All of the points which had been raised by the pursuers in their submission had been made to the judge. *Hills v Nixsun (supra)* was distinguishable. When all of the evidence, notably that of the experts, based on all of the detailed primary evidence, was looked at, it could not be said that the judge did not have evidence that entitled him to reach the conclusion that reasonable skill and care had been exercised.

[202] The commercial judge had not just been faced only with expert evidence. He had heard from the members of the TBM crew who had spoken to the process carried out in the tunnel, the work of Mr Taylor and the role of Jacobs. They had described the care taken by Mr Taylor and what could be seen in the tunnel. Mr Sandilands spoke about the role which both Jacobs and Pöyry had played. The judge had heard from others who had inspected the tunnel, notably Prof Broch. Prof Müller, the defenders' design co-ordinator, spoke to the RSM, the REC sheets and the risks which had to be taken into account.

[203] In their pre-proof preparations, the pursuers had asked the defenders if there was any objection to them speaking with Mr Taylor. There had been none. One condition had been that the pursuers provide the defenders with Mr Taylor's details, since they had lost contact with him. The pursuers did not do so.

Reasonable skill and care (Grounds 5, 9 and 10)

[204] There was no merit in the individual points taken by the pursuers. The pursuers founded on the evidence of Dr Wilhelm, but he was giving evidence with the benefit of hindsight. He was explaining that, although the shear zones on the mapping would not

explain the collapse, they must have been interconnected above the HRT. He did not say that the collapse could have been anticipated. The commercial judge listened to the pursuers' submission on precisely this point and made positive findings that nothing could have been seen in the tunnel.

[205] In his email of 28 August 2007, Mr Taylor had recognised that, during the time when the TBM crew were in the CFZ, it would be prudent to maintain a minimum class of support, even although the rock conditions, superficially, may have looked like class I. There was nothing in this that involved missing something indicative of a potential collapse. The commercial judge rejected the idea that Mr Taylor's reference to specific hazards during excavation meant that the REC sheets had failed to address long term risk. The judge was entitled to take into account the fact that no problems had been encountered when the TBM had passed through the CFZ.

[206] The REC sheet for chainages 2084 to 2082 had a majority of ticks that were either class II or III; yet the overall class was I. This area had been only 2 metres wide. There was no evidence that it could have caused the collapse.

[207] Mr Speirs' minute of the meeting on 9 September 2007 supported the commercial judge's conclusion that there had been nothing to be seen in the CFZ. The document, which was agreed as being what it bore to be, had been referred to by Mr Sandilands. It was there for the judge's consideration.

[208] Simply because kakirite was recorded on mapping, and ought to have been mentioned on the REC sheets, did not mean that class IV had been required. Merely because the mapping and the relative REC sheet were not identical, did not mean that they were inconsistent. The alternative explanation was that, as part of the holistic exercise, any kakirite had been so minimal that it did not create an issue about the support level.

Everyone would have seen the reference to kakirite and none had suggested that there ought to have been class IV support. The REC sheets and the mapping were agreed to be what they bore to be. That did not mean that they were true and accurate. It was up to the commercial judge to determine that. He was not just given them and asked to reach a conclusion based on what he could see. He had the testimony of those who had described them. Prof Broch had investigated the locations described by Pöyry. He had found no major weakness zones and considered that the support measures were more than good enough.

[209] The reference to chainages 2117 to 2101 was another isolated attempt to undermine the exercise of judgment at one location. The commercial judge held that the Pöyry findings had been minor. Those in the HRT had inspected not just the areas focused by Pöyry, but also the whole of the tunnel. The suggestion, that if Pöyry had inspected the whole tunnel the result would have been different, was destroyed by the finding that there was nothing to be seen.

[210] In relation to the dip of $<50^\circ$, even Prof Sloan had not categorised this area as class IV. Dr Büchi had explained that, although there might have been some areas which pointed towards class III, that did not mean that the overall rock mass should be classified as such. The classification was a summary of all aspects. Dr Büchi did not consider that the mapping and the REC sheet meant that the area should be class IV overall. The commercial judge's use of the rhetorical question: "Why go to the trouble of identifying such features and then decide to do nothing about them?" was based on the evidence of Dr Büchi and Prof Sloan's report.

[211] The commercial judge found that Table 11 did not place a mandatory obligation on the defenders to shotcrete all erodible rock. The pursuers' contention, that class III or IV

support was required whenever the defenders discovered erodible rock, was indicative of a painting by numbers approach. If the pursuers were correct, determination of overall class would have been reduced to a mechanistic process, dependent on the worst feature ticked. The process was, on the contrary, a holistic exercise of engineering judgment. There was positive evidence in favour of the conclusion that the risks stated on Table 11 had been taken into account. Just because the REC sheets contained no express reference to Table 11, did not mean that the issues raised in it had not formed part of the engineering judgment.

[212] The evidence did not support the pursuers' contention that there was a two-stage system involving, first, excavation and, secondly, operation. The commercial judge referred to the pursuers' contention that the REC sheets had only addressed hazards during excavation as "startling". He posed the rhetorical question: "why would the defenders construct a tunnel with no thought to its long term stability?" In the email, Mr Taylor had simply been explaining the dangers during excavation. The judge was entitled to find that the proposition was startling because of two tracts of evidence. First, Prof Müller had said that everything had been covered in the REC sheets. Everybody had known that they were engaged in building a hydro-electric tunnel. Everyone had known whether they were in the HRT or the TRT. It was obvious that, when building a pressurised tunnel, account had to be taken of that element. Secondly, Dr Wilhelm had said that working safety was an issue during construction, but rock classification had to take into account overall stability during operation. The judge had heard that the defenders, Jacobs and Pöyry, who had inspected the tunnel in January and February 2008, were actively looking for problems. Prof Broch had inspected the tunnel. The proposition, that all of these people were only considering health and safety during excavation, was absurd. Dr Büchi spoke to the REC sheets dealing with operational matters, including erosion. Even if Prof Broch had supported this theory at

the Adjudication, he was only one witness and he had not been involved until after the February 2008 inspection. The Pöyry guideline, which required observation of the behaviour of the rock behind the face, should be regarded not as a two-stage process, but as part of an ongoing process of checking and revising. The judge took it to be consistent with the defenders' position that it included taking into account operational risks. The extremity of the pursuers' position was that, in building a hydro-electric tunnel, the defenders, Jacobs, Pöyry and Prof Broch had not considered the effects of flowing water under pressure. The lack of a response to the query from Jacobs about the definition of erosion was only one of many factors involved in the judge's decision. There was no evidence to suggest that the parties had had any difficulty in understanding the meaning of erodible rock.

Paragraph 6.1.5 of the RSM was not now founded upon.

[213] The commercial judge made very detailed findings about the 2008 inspections.

Prof Broch had observed the tunnel only 13 days after the Pöyry inspection. He had looked at the locations described by Pöyry and had walked the parts of the tunnel in between.

There had been joint inspections thereafter, when Mr Speirs had expressed a concern about the lower side wall, but had been reassured that, if erosion occurred, it would not affect the stability of the tunnel. The argument, that Pöyry would have noticed something in the collapsed zone and recommended installing something major, ignored the judge's findings in fact that: (1) there was no problem to be seen in the tunnel; and (2) the issues which gave rise to Pöyry's recommendations had been minor and all had been resolved prior to watering up. The Pöyry report had given rise to defects notice D033, which had been "closed off".

[214] The pre-watering up inspection had been to clean out the tunnel to make sure there was nothing in it which could flow down and damage the turbine. It was not an inspection

of the geology or support installed. The erosion noticed in October 2008 was not the same as that which had been noticed earlier, given the closing off of defects notice D033. What was noted was what had been expected by way of rockfall. This was consistent with defects notice D041, which recorded a significant quantity of gravel, sand and silt in the rock trap. It noted the presence of significant voids below the invert, where weak and/or sheared rock had been eroded by the water flushing exercise. Defects notice D044 had recognised what required to be done and that it was appropriate to hold off remedying the defects until the first dewatering. The witnesses had stated that there were no concerns about the watering up on 27 November 2008. The points raised by the pursuers were all miniscule matters that had to be looked at in the context of an 84 day proof. The commercial judge heard them and made nothing of them. Looking at them on the printed page, it was readily understandable why he reached that view. If the judge did not give the pursuers' points greater prominence in dismissing them, that reflected their inherent weakness. It cannot be said that he was plainly wrong.

Risk and indemnity (No ground)

[215] There was no separate submission.

Inadequacy of reasons (Ground 6)

[216] Although he had summarised his reasoning adequately, the commercial judge must have had regard to the "penumbra of imprecision" (*Biogen v Medeva* [1997] RPC 1 at 45). An appellate court was bound to assume that a judge has taken into account the whole of the evidence (*Henderson v Foxworth Investments* 2014 SC (UKSC) 203 at para 48; *Thomas v Thomas* 1947 SC (HL) 45 at 61; and *Housen v Nikolaisen* [2002] 2 SCR 235 at para 72). It was entirely appropriate for the judge to summarise and marshal points at an appropriate level of

generality, with a view to focusing the issues and not getting lost in the detail (*McLeod's Legal Representative v Highland Health Board (supra)*, para [93]). Read as a whole, the judge's Opinion was far from being an oracular pronouncement (*McLeod's Legal Representative (supra)* at para [91]; citing *Dingley v Chief Constable Strathclyde Police (supra)* at 555).

Reliance on documents not spoken to (Ground 7)

[217] The commercial judge's findings on the mapping and REC sheets did not proceed on an assumption that they were true and accurate, but on the basis of the evidence. The TBM crew had referred to the sheets having been completed by Mr Taylor in consultation with Jacobs. Mr Sandilands had expressed his view on the importance of the REC sheets and Jacobs' signature binding the pursuers. The experts had spoken to the high standard of mapping.

[218] The commercial judge had been entitled to take into account the terms of the minute noted by Mr Speirs and the report from Mr Fawcett. The former had been referred to by Mr Sandilands and the latter by his successor, Mr Brand. Mr Brand had referred to Mr Fawcett's role.

Causation (Ground 11)

[219] It was a curiosity that causation was a miscellaneous ground of appeal, when it was so crucial. The experts were generally agreed that only class IV support would have prevented the collapse, yet no one had suggested the use of class IV at any point in the tunnel. The only class III that was ever installed was at chainage 2120, where increased shotcrete had been installed. The pursuers had maintained that at least class III should have been installed. The commercial judge accepted the preponderance of the evidence, notably that given during the hot tubbing, which favoured the conclusion that only class IV would

have prevented the collapse. The judge accepted the evidence of four out of the six experts. That was not something which could be regarded as “plainly wrong”.

[220] It was not enough simply to say that the defect consisted of insufficient support. The pursuers had to point to the defect by reference to the observational method. The pursuers required to prove that the loss and damage had been due to a defect which existed at take over. There had to be a causative link between the defect and the loss and damage. This issue was no different in connection with the correction of defects under section 4, where the pursuers were seeking the cost of having the defect remedied. The pursuers had to establish that these costs were those for remedying the defect and not for remedying a lack of support. Demonstrating that the collapse would have been prevented had the defenders installed the support necessary to avoid that collapse, did not identify what, or where, the defect was. The pursuers had to be able to say that the defenders had to incorporate class IV support at the point of collapse. If the obligation was only to shotcrete erodible rock, the collapse would have happened anyway.

Secondaries (Ground 12)

[221] The commercial judge found that the secondaries did not constitute defects. Attempts had been made to locate the secondary defects, but Prof Broch, who had inspected the HRT in January 2011, had concluded that they were all either rock features which could be safely left unsupported or minor rock fallouts which might be expected on a first dewatering. Dr Billig’s analysis was that none posed a risk to stability. Although at one point Dr Billig had said that he had not thought about the operation of the tunnel, it was clear that he was considering its load carrying capacity. He had discussed erosion, which necessarily involved operation.

[222] The commercial judge had recorded that the point about the secondaries had not been pressed by the pursuers, although it was now. On 13 April 2010, the defenders, Donaldsons, Jacobs and BAM, had all gone into the tunnel to find the faults recorded in the defects notice D058. They had failed to do so. Even after the problem about the revised chainages had been resolved, Mr Becker, who had been one of the defenders' staff, had testified that the features did not look like defects. The evidence was all consistent with minor rock fallout.

[223] The contention that it was reasonable for the pursuers to repair secondary defects, given the nature of the collapse, was a view which might be taken from an economic standpoint but it was misconceived from a legal perspective (*Governors of the Hospitals for Sick Children v McLaughlin & Harvey (supra)*). The defenders were not liable for the secondary features because they were not defects.

Clause 82.1 damages (Ground 13)

[224] The argument that, because the defenders had said that they could repair the tunnel for £30 million, they should get the difference between that and the actual cost of repair, ignored the fact that the £30 million figure had been based on the discredited evidence of Mr Hunter.

[225] The commercial judge had erred in finding that the defenders had been in breach of clause 82.1. He ought to have found that the pursuers had placed unlawful pre-conditions on the defenders. The pursuers had insisted upon a concrete invert, the DAT and BPT. They had wanted this work carried out as quickly as possible in order to mitigate their loss of profit. They were attempting to impose an ultimatum that the design for the remedial

works had to incorporate three specific aspects. The pursuers would not have allowed the defenders to have complied with clause 82.1.

Expenses (Ground 14)

[226] The commercial judge's decision constituted a reasonable exercise of discretion.

Success was a relative term and great latitude was allowed in defining it (McLaren: *Expenses*, p 22; *Gye & Co v Hallam* (1832) 10 S 512). In general, awards would not normally be made for different aspects of a proof. McLaren post-dated the introduction of the tender system (*Heriot v Thomson* (1833) 12 S 145).

[227] The starting point was the "vindication of rights". The cost of litigation should fall on the person who has caused it (*Shepherd v Elliott* (1896) 23 R 695, at 696). Success was not capable of determination according to rigid rules. It was ultimately a matter of discretion (*Howitt v W Alexander & Sons* 1948 SC 154, at 157). Where there was divided success, there could be many permutations (*ibid* at 158; *McFadyen ed.: Court of Session Practice* at para L103). If there were distinct, severable branches and the parties had been successful in different ones, this could be described as divided success (*ibid*).

[228] The pursuers' award for low availability damages, which took up no time in evidence and minimal time in submissions, was a very small percentage of the sum sued for. It involved a minor skirmish in the context of the case as a whole. It was a Pyrrhic victory in circumstances where the real success was on the part of the defenders (*ibid*; *D Macdonald & Bros v Cosmos Decorators* 1969 SLT (Sh Ct) 9 at 10). If the sums which the pursuers had been awarded had been offered pre-proof, the litigation would still have gone ahead. The fact that the defenders could have tendered was a factor to be taken into account, not in

determining the question of success, but in the modification of any award (*Sidlaw Industries v Cable Belt* 1979 SLT (Notes) 40, at 41).

[229] The deduction of 5% from the defenders' expenses was a proper exercise of his discretion. The 5% discount was not *de minimis*. It represented a very significant amount of money.

Cross Appeal

Joint insurance

[230] The commercial judge had erred in holding that clause 84 did not preclude a claim by the pursuers against the defenders for loss and damage due to a contractor's risk. By entering into clause 84, the parties had agreed that they would look only to the insurance monies in respect of risks falling within the policy. There was a longstanding rule that an insurer could not, by way of subrogation, sue one co-insured in the name of another (*Commonwealth Construction Co v Imperial Oil* (1977) 69 DLR (3d) 558 at 561; *Petrofina (UK) v Magnaload* [1984] QB 127; *Stone Vickers v Appledore Ferguson Shipbuilders* [1991] 2 Lloyd's Rep 288; and *National Oilwell UK v Davy Offshore* [1993] 2 Lloyd's Rep 582). Since *CRS (supra)*, it had been clear that the rule was founded on contract. A term fell to be implied into the main contract (*Hopewell Project Management v Ewbank Preece* [1998] 1 Lloyd's Rep 448; *CRS* at paras 48-50; *Scottish & Newcastle v GD Construction (St Albans)* [2003] Lloyd's Rep 809; *The Board of Trustees at the Tate Gallery v Duffy Construction* [2007] Lloyd's Rep 758).

[231] An implied term could not withstand express language to the contrary (*Tyco Fire & Integrated Solutions (UK) v Rolls-Royce Motor Cars* [2008] Lloyd's Rep 617 at 76). If an underlying contract envisaged continuing liability on the part of one co-insured to another, even within the sphere of the cover provided by the joint policy, subrogated claims would

not necessarily be precluded (*ibid* at 77). In the “*Ocean Victory*” (*supra*) the Court of Appeal and the majority of the United Kingdom Supreme Court concluded that the principle was best viewed as resting on the natural interpretation of, or implication from, the contractual arrangements giving rise to the co-insurance (*ibid* at para 114). The commercial judge erred by having regard to, and giving weight to, contractual terms which he considered to point against the joint insurance provision precluding litigation.

[232] Even the minority in the “*Ocean Victory*” (*supra*) had acknowledged that, where it was agreed that insurance would inure to the benefit of both parties, they could not claim against each other in respect of an insured loss. There was a well-established rule to that effect. The distinction between the majority and the minority was whether the joint insurance meant that there was no liability at all between co-insured, or whether the liability was satisfied by the joint insurance provision. That was not in issue in this case.

[233] In a situation where a party had failed to take out insurance, as provided for by the joint insurance clause, the risk would fall where it fell. The possibility of an insolvent insurer was remote and could not be a factor within the contemplation of the parties. The parties had not anticipated a shortfall, as they had agreed that the insurance was to be for replacement cost. If a party failed to take out insurance, the effect of the joint insurance provision in the contract was the same (*Scottish & Newcastle v GD Construction (supra)*, at para 28). The rest of the contractual provisions could be read consistently with the joint insurance provision. The commercial judge erred in concluding that certain terms were inconsistent with the purpose of clause 84.

[234] If the pursuers’ submission was correct, it would render clause 83 redundant. Under clause 84, the insurance was taken out for a defined period. In contrast, the indemnity under clause 83 was wide ranging, and included employer’s risks. It would allow for the

recovery of potentially substantial deductibles, which could arise. The inclusion of clause 85.2 had been a “belt and braces” approach; to make it clear that there was no possibility of recovery against directors or employees either. There was no relevance to the lack of any express waiver, and the commercial judge erred in taking that into account. The judge’s decision deprived the parties of the protection of the implied term on the basis of minor inconsistencies with different contract terms. Those terms could have been reasonably interpreted as applying to different contractual obligations (Reed: *Construction All Risks Insurance* (2nd ed), para 20-049).

[235] The effect of clause 84 should be viewed in the context of a coherent regime in relation to liabilities. Where the contractor failed to correct defects, the employer was entitled to recover the cost. The position was different in relation to loss and damage. The responsibility for them depended upon whether the risk was that of the employer or the contractor. The distinction between defects and loss and damage had a commercial rationale. The contractor was responsible for carrying out the works so that they were free from defects. He was therefore, subject to the provisions of Option M, responsible for repairing them at his own cost. The position was different in relation to loss and damage, which was fortuitous and could be insured against.

Breach of clause 82.1 (Ground 2)

[236] The commercial judge erred in holding that the defenders had been in breach of clause 82.1 and prevented from counterclaiming successfully. The purpose of clause 82.1 was to prevent wrangling about payment until any repair had been completed. In order to oblige the contractor to carry out the repairs, the employer required to present a *prima facie* argument that the event had been a contractor’s risk. At the stage at which the defenders

had been called upon to carry out the repairs, the pursuers had not been able to present such a *prima facie* position. The defenders had been entitled to rely upon the indemnity and insist on payment. Clause 82.1 had to be read with clauses 60 and 80. The defenders' position, as set out in the letter of 25 September 2009, had been that they were ready to mobilise to carry out the repairs in terms of clause 82.1. In terms of clauses 61.3 and 80.1, the cost of repair fell to be reimbursed.

The counterclaim (Ground 3)

[237] There were two elements to the counterclaim. First, there was indemnification under clause 83.1 for costs which were due to an employer's risk. These included the immediate investigation of the collapse, the monitoring of the remedial works carried out by the pursuers, the costs of the Adjudications, the cost of litigation and the management time expended on dispute resolution. Secondly, there was the defenders' entitlement to carry out the repairs themselves. The commercial judge's finding that the defenders' costs had not been incurred due to the collapse was wrong. The test was whether the collapse had been an effective cause of the costs (*ENE Kos I v Petroleo Brasileiro (No. 2)* (*supra*), at para 12). It had to be an effective cause, but it did not need to be the only cause. The legal costs and management time were caused by the collapse. The Adjudications were a direct consequence. The pursuers had raised this litigation in order to displace the results of the Adjudication. The indemnity provided for the recovery of the costs of this litigation; recognising that any modification by the court would break the causative link.

[238] The defenders' obligation under clause 82.1 was not reciprocal to the pursuers' obligation to indemnify. The costs to be indemnified, such as those of the Adjudications and the litigation, bore no relation to clause 82.1. The defenders' costs in successfully vindicating

their position were not dependent on clause 82.1. The authorities on mutuality were well-known (*Bank of East Asia v Scottish Enterprise* 1997 SLT 1213, at 1216, citing *Turnbull v McLean* (1874) 1 R 730, at 738). Each obligation by one party was not necessarily the counterpart of every obligation by the other (*Macari v Celtic Football Club* 1999 SC 628, at 640). A party in breach was not entitled to insist on the other party performing his counterpart obligations, but caution should be taken to avoid splitting the contract artificially (*Inveresk v Tullis Russell Papermakers (supra)*, at para 43).

Repayment of the second adjudicator's award (Ground 4)

[239] The commercial judge erred in obliging the defenders to repay the sums under the second Adjudication. The sums fell entirely within the indemnity. The second adjudicator had effectively permitted the defenders to enforce the indemnity under clause 83 on the basis that these were costs which were due to an employer's risk event. The pursuers had argued that the defenders required to repay the sums as they had not effectively been caused by the collapse. The argument had now evolved into an adoption of the judge's reasoning that the defenders were not entitled to payment because of their breach of clause 82.1. The defenders had been entitled to retain the payment by the pursuers under the adjudicator's award as they had not breached clause 82.1. If there had been a breach of clause 82.1, the payment fell into the category of costs which the defenders were entitled to recover anyway, irrespective of their breach of clause 82.1.

Low availability damages (Ground 5)

[240] The commercial judge erred in awarding the pursuers low availability damages of £1 million under the terms of the bespoke clause 48.2. Clause 80 (Z11) provided that there was no liability for indirect consequential loss, ie loss of profit. Clause 48.2 was an exception

to that general position, but it required to be read in conjunction with the indemnity in clause 83.1. If the reason for the plant operating below the low availability standard had been the collapse, and the collapse was an employer's risk, the defenders were strictly liable under clause 48.2, but were then entitled to the indemnity under clause 83.

[241] The pursuers' claim had not been based on the defenders' breach of clause 82.1, but on the fact that the plant had been unavailable for many months. The commercial judge treated it as a free standing claim, which did not depend upon any defect or breach of contract. By the time of the By Order, the argument had shifted to focus on the low availability damages as a consequence of the breach of clause 82.1. The judge awarded damages because of the defenders' refusal to return and carry out the recovery project in breach of clause 82.1. If there had been no breach of clause 82.1, the entitlement to the low availability damages fell away.

[242] Even if there had been a breach of clause 82.1, there was no evidence to substantiate the low availability damages. The pursuers would have required to plead and prove that a part of the two year delay had been due to a breach of clause 82.1. The pursuers' retrospective attempt to tie the damages to a breach of clause 82.1, as distinct from 48, did not work, because the evidence was not there.

Quantum (Ground 6)

[243] The commercial judge erred in concluding that the hypothetical sum, to which the pursuers would have been entitled, amounted to in excess of £107 million. All the pursuers had done was lead evidence of the money which had been expended on the remedial works. They had sought to attribute that sum (£129 million) to various heads of claim and to establish the reasonableness of the works carried out. The pursuers had not led evidence of

a causal link between the collapse and the sums which had been expended. The only evidence had been that the remedial works had been reasonable, that a total of £129 million had been spent on the works, and that certain deductions had been made by the judge on the basis that the defenders could not possibly have been liable for those.

[244] The pursuers' head of finance had given evidence about the pursuers' accounting systems. He had not carried out any exercise to ascertain which costs had been a consequence of the collapse and which were not. The pursuers' cost expert had provided a detailed assessment of the costs of the recovery project. He had expressly said that he had not looked at causation. The pursuers' witnesses on monitoring had simply checked to see whether the projected costs had been accurately forecast. The pursuers had contracted for the remedial works on a costs plus a percentage basis; ie Option E. It did not follow that each and every cost had been connected to the works carried out. The commercial judge had erred in adopting a "top down" approach by starting with the sum claimed by the pursuers and deducting sums which could never be attributed to the defenders (*AXA Insurance UK v Cunningham Lindsay United Kingdom (supra)* at 276-287).

Downstream access tunnel (Ground 8)

[245] The commercial judge erred in allowing the costs of the DAT to be recovered. The purpose of the DAT was to allow tunnelling from both ends, to speed up the works, and to reduce the time that the plant was out of operation. Recovery of the costs of the DAT would cut across clause 48.1, which provided the only remedy for loss of profits. Clause 80 (Z11) prevented any claim for consequential loss. The pursuers were entitled to take a commercial decision to try to get the plant up and running as quickly as possible, but the terms of the

contract had to be applied in determining whether they were entitled to recover that from the defenders.

Operation of the scheme (Ground 9)

[246] The commercial judge erred in rejecting the argument that the pursuers' operation of the plant had been an employer's risk event. The pursuers ought to have noticed that the needle valves had been opening beyond their normal parameters. The judge erred in fact in finding that the needle readings had not been relayed to Perth. The signals had been relayed, although they did not produce an audible alarm. The judge did not consider what the consequences, of the needle valve signal being available in Perth, had been.

[247] The pursuers had been provided with a large number of maintenance and operating files by the defenders. To make the information manageable, the pursuers had produced operational notes. The notes were incomplete in relation to needle valve openings. Claire McConnell, who had been responsible for preparing them, had accepted that they ought to have said something about them. If information on the normal parameters had been in the notes, the engineers would have noticed the developing trend. Acting with reasonable diligence, they would have become aware of the collapse by April or May 2009. The extent of the collapse would have been far less, and the cost of remedying it would have been correspondingly less.

[248] Clause 83.2 provided for a proportionate reduction if events were contributed to by the party seeking the indemnity. The commercial judge had characterised this as contributory negligence, but it was really an issue of causation. If part of the pursuers' loss had not been related to the contractor's risk event, but to their operation of the plant, there ought to have been a proportionate reduction. Clause 80.1 provided that, included within

employer's risks, were costs due to his negligence or fault. The failure to update the operational notes had amounted to negligence, failing which, at least fault. Fault involved a lesser degree of culpability than negligence (*City of Manchester v Fram Gerrard (supra)* at 90; Thomas: *Keating on NEC 3* at para 9-007).

[249] It was not possible to give a precise quantification of the level of collapse in April or May 2009. Dr Büchi had said that the extent of the collapse had increased each time the plant had been operated. He had tried to estimate the total rockfall in April or May. In the face of a lesser collapse, the appropriate remedy would have been to tunnel through at a cost of just over £5 million. The pursuers had led no evidence to challenge either the theory about the collapse being a lesser one, or the ability to tunnel through or the cost of that.

Decision

Principal Appeal

Interpretation of the contract and a defect at take over

[250] There can be little doubt that the collapse of the HRT resulted in loss of, or damage to, the works. The first question of contractual interpretation is whether, irrespective of whether that loss or damage was caused by a defect, the defenders were obliged to replace the loss, or to repair that damage, under the terms of clause 82.1, given that it was caused before the issue of the defects certificate, due 2 years after take over. It is clear that the defenders were indeed obliged to do this. Their refusal to do so was a breach of contract (see *infra*).

[251] The second question involves identifying who was responsible for paying for any replacement or repair to the loss and damage. That turns on where the risk lay. It would rest with the pursuers unless the loss and damage was due to a defect which existed at take

over in terms of clause 80.1. The cost of any replacement or repair incurred by the defenders would, other than in the event of such a defect, be subject to indemnification by the pursuers under clause 83.1.

[252] The third question is whether the collapse of the tunnel occurred because of a defect which existed at take over; that is to say that either a part of the works was not in accordance with the works information or a part of the works designed by the defenders was not in accordance with the contractor's design as accepted by the project manager (clause 11.2(15)). This requires an analysis of each of these two elements.

[253] On the first element, the works information contains a general description of the works (Sch Pt 3, sec 1, para 2.1). It was to be a hydro scheme providing reliable service without the requirement of major refurbishment or significant capital spending within the design life of the scheme. The design life for the HRT, which was a component of the civil works, was 75 years (*ibid* para 6.3.2). This was not qualified by paragraph 6 of Schedule Part 7, which did limit the life of some components but not the general requirement.

[254] The general requirement involved the creation of a tunnel with a 75 year design life. That requirement did not guarantee such longevity. It meant merely that the design was one which, if properly implemented, ought to have produced an HRT which lasted that long (*MT Højgaard v E.ON Climate & Renewables UK Robin Rigg East* [2017] Bus LR 1610, Lord Neuberger at paras 30 and 32). If what was constructed was not capable of lasting for the design period, it would not be in accordance with the works information. If that were so, there would be a defect in terms of the contract (clause 11.2(15)) and a failure to provide the works in terms of the works information (clause 20.1).

[255] *MT Højgaard* (*supra*) involved a requirement that wind turbines have a design life of 20 years. There was a two year period in which to give notice of a defect. It was said, no

doubt correctly, that this enabled the employers to use that time to inspect the turbines and to detect any such defect. That is not dissimilar to the contract between the parties.

However, the defect in *MT Højgaard* was a miscalculation of the capacity of connectors in the original design. The design as built could not have lasted for the stipulated life span. That is different from a situation in which it is accepted, apparently by all, that the defenders' (or rather Pöyry's) design for an unlined tunnel (ie the HRT RSM and Drawing D201, *infra*) ought to have lasted for the 75 year period, at least in the ground conditions then understood to exist and as set out in the relative report (Sch Pt 3; Appdx 12 *supra*). Since what is under consideration is design life, it is only if an inconsistency between the design (as accepted) and the potential 75 year life can be found that a defect can be said to have existed.

[256] The commercial judge did not directly address the question of whether there was a defect of this nature. His findings in fact are indicative of a fault existing at take over in that, as the judge held (para [147]), the support provided was "not enough"; "poor rock conditions coincided with insufficient shotcrete and rockbolts". Given the actual state of the rock, the HRT could not have survived for 75 years, or even 1 year, in the conditions which in fact existed. The question then is whether the HRT can be said to be disconform to the works information (ie the design life) by virtue of its (very) early collapse. The evidence, beyond 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 what was proposed and accepted was appropriate.

[257] In terms of the works information, the detailed design (RSM and Drawing D201, see *infra*) was to be "developed through construction detailing and method statements" (Sch P 3,

sec 1, para 6.2.8.4). The contractor was to map the HRT to enable the rock mass classification system to operate (*ibid*, section 2, para 2.3.1). This was expanded with the terms of the Pöyry design statement (Sch Pt 7; Appdx 6) which used this system. It was Pöyry who had said that, with the use of the TBM, the HRT was feasible, with 60% unlined, without compromising the design life (*ibid* para 2.4). What was to be constructed, using this design, ought to have lasted for the required period despite its early collapse. The submission that the works, as designed and built, were disconform to the 75 year requirement in the works information must therefore be rejected.

[258] Before the second element can be considered, it is necessary to decide precisely what the contractor's design was. The contract makes it clear that the design was something which was to be "accepted" by the project manager (clause 21.2; Sch Pt 3, sec 1, Pt 6, paras 6.2.8.1 and 6.2.8.4). What was accepted was the HRT RSM, (Drawing D152 etc) which included Table 11, and Drawing D201, which detailed the rock support appropriate for specified rock conditions. The contractor's design was that contained in those documents, each of which was accepted by Mr Sandilands. What occurred in the HRT as the TBM progressed, with the preparation of the REC sheets and the mapping, was an exercise in the implementation of that design. The REC sheets and mapping may have been "approved" by Mr Sandilands, but they were not "accepted" as required by the contract. It is the contract which must govern the relationship between the parties, irrespective of what those in the tunnel thought they were doing in "approving" the defenders' proposed tunnel support. The later actings of the parties during the performance of the contract cannot assist in its construction (*Whitworth Street Estates v Miller* [1970] AC 583, Lord Reid at 603). No question of waiver or personal bar was raised. The contract makes it clear (cause 14.1), in

any event, that acceptance of a communication from the contractor or of his work does not alter the contractor's responsibility to provide the works or his liability for his design.

[259] In order to succeed in proving the existence of a defect on this second element, the pursuers now rely solely on a contention that there was erodible rock that was not shotcreted as it should have been in terms of Table 11; that being part of the design. The commercial judge held (para [152]) that the collapse occurred because weak rock deteriorated when submerged. Erodible rock was washed out and larger seams were created. It may be assumed, from the judge's finding, that some erodible rock had not been shotcreted, although it does not follow that the erodibility of the rock was visible or detectable by the geologists on site. The judge was careful to point out that the mechanism of the collapse involved the deterioration of the rock, after it had been submerged, prior to it becoming erodible. It should also not be assumed that whatever rock had become erodible had not been shotcreted. The hazard of shotcrete cracking and being washed away was also recognised in Table 11 (hazards during operation).

[260] The issue essentially boils down to a legal, and not a factual, question of whether there was a mandatory requirement to shotcrete every area of erodible rock, however unimportant the area might have seemed to an experienced geological engineer on site. Although there may again have been a tendency on the part of the commercial judge to interpret the contract terms by looking at how they were operated in practice, he rejected (at para [167]) the contention that Table 11 had required the shotcreting of all erodible rock for several reasons. One critical one was that, if it had done so, it ran counter to the other contractual provisions which called for the exercise of engineering judgment on site. This is a reference to: (a) clause 6.2.8.4 of Contractor's Design (Sch Pt 3, sec 1), which stated that the accepted design was to be developed through construction detailing and method

statements; (b) the provisions (*ibid*, sec 2 para 2.3.1) requiring the contractor to map the tunnel after excavation and to agree the “rockmass parameters ... and the support class” with the project manager; and (c) the Pöyry design statement (the Pöyry Guidelines) (Sch Pt 7; Appdx 6, para 2.4) which required the contractor to determine the “actual support requirements during the tunnel advance based on actual conditions encountered, particularly with reference to the identified risk situations”. The latter was a reference to one identified in the RSM, including the erodible rock hazard mentioned in Table 11.

[261] Neither Table 11, nor any other contractual document, stipulates that all erodible rock required to be shotcreted. Table 11, as it was no doubt correctly described by Prof Müller, was a “risk-handling matrix ... used ... during the tender negotiations”. It was part of the RSM; being page 35 of some 38 pages. It comes at the end of a section of text headed “6.5 Hazard control Tunnel/General Guidelines” which “suggests” methods of dealing with hazards. It is a table which identifies a number of hazards, including the detachment of wedges, cracking of shotcrete, scouring of the lining and “the erosion of erodible rock during operation”. It specifies countermeasures; being shotcreting in the case of identified erosion. However, it is tolerably clear, when the whole of the RSM is read, that it is not prescriptive. It is, as it states, a guideline with suggested countermeasures to meet predicted general hazards. It is not entirely clear that the specific hazard of erodible rock is covered by the text or, if it is, what is suggested as a remedy.

[262] The commercial judge’s approach to Table 11 is correct. It is simply not established, from looking at the contractual documents, that all erodible rock required to be shotcreted. In the circumstances, the case, based on an short passage in a table forming a relatively small part of the totality, is not made out.

[263] It is only once it has been determined that there was a defect at take over (ie if the above analysis is incorrect) that consideration requires to be given to the fourth question of whether the limitation on the contractor's liability for defects due to his design in: (i) the description of the contractor's main responsibilities; and (ii) the similar but more general provisions of Option M, apply in a manner which removes any liability for defects if the contractor proves that he used reasonable skill and care to ensure that his design complied with the works information. Both of these provisions limit the liability of the contractor to pay damages for loss which occurs as a result of a defect in the works due to the contractor's design. They affect liability, which is determined by section 8 of the contract (Risks and Insurance). The effect of Option M is to qualify clause 80.1, by providing the contractor with a defence of reasonable skill and care even when the loss or damage occurs because of a defect which existed at take over. Clause 80.1 is the only provision in the contract which apportions the risk of liability between the parties for a catastrophic failure of the type that occurred.

[264] The allocation of risk or liability for damages is separate from the question of who should carry out work to correct defects and bear the initial cost of doing so. Section 4 (Testing and Defects) makes it clear that the contractor is obliged to correct a defect (clause 40.4), irrespective of its cause during the defect notification period (clause 43.1). If the contractor fails to do so, the employer can assess the cost of correction by another and the contractor must pay this amount (clause 45.1). This provision allows an employer to take payment for any remedial work, *in lieu* of the contractor carrying out the work, if the contractor is unwilling or unable to do so.

[265] The obligation on the contractor to correct defects is qualified by the bespoke clauses, including clause 46.1, which provides that he is not obliged to carry out repairs which are a

result of normal wear and tear, and clause 46.2, which provides for the defects date to be delayed. In terms of clause 46.4, the parties agreed that the contractor would have an obligation to correct defects “at his own cost and expense and with all possible speed” for a period of 12 years after the issue of the defects certificate. If the contractor failed to perform this obligation, the employer could recover the cost of employing others to carry out the work, in the same way as is provided for under clause 45.1.

[266] Both the general and the bespoke provisions are silent on the question of who is ultimately liable for the cost of the repairs. That is not surprising, given that section 4 deals with “testing and defects”, and not the allocation of risk. Where an employer’s risk event occurs, the contractor is obliged, under the terms of section 4, to return to site, to correct the defect and to bear the cost of doing so. This is reinforced by the terms of clause 82.1, which require the contractor to carry out repair works promptly, before the issue of the defects certificate. If the contractor refuses to return, the employer may claim the cost of the repair from the contractor. However, if the event is ultimately found to be an employer’s risk, the contractor is entitled to be indemnified by the employer for the costs incurred as a consequence (clause 83.1).

[267] The general description of the contractor’s main responsibilities provides that liability for defects due to his design, which are not identified prior to the defects date, will be limited so far as the contractor can prove that he used reasonable skill and care to ensure that the design complied with the works information. This is consistent with Option M which, when read with clause 80.1, provides that loss or damage to the works taken over by the employer and occurring before the issue of the defects certificate, which is caused by a defect which existed at take over, will be the contractor’s risk unless the contractor can establish that he used reasonable skill and care. The defenders’ liability for identified and

unidentified defects, which give rise to loss or damage to the works, are both limited to the exercise of reasonable skill and care.

[268] The structure of the contract is then that the contractor is obliged to correct all defects notified prior to, or specified in, the defects certificate. This is regardless of whether the defects were caused by fault and negligence in the design. This is clear from the provision (clause 45.1) which permits the employer to recover the cost of having a defect corrected by another from the contractor. Normally, the employer would only be at risk once the defects certificate has been issued and then only for defects not specified in that certificate.

However, the bespoke provisions of this contract (clause 46.4) provided that the contractor must make good at his own cost and expense any defect in the civil works appearing during the period of 12 years after completion (take over).

[269] Section 8 allocates liability to pay for loss or damage as a result of a defect in the works following take over by the employer. That loss will be an employer's risk, unless it occurred before the issue of the defects certificate and was due to a defect which existed at take over. In that event, the contractor will bear the liability for the loss and damage, unless he can show that he exercised reasonable skill and care in ensuring that the design complied with the works information. If the contractor is obliged to correct a defect which was an employer's risk event, he will be entitled to the benefit of the indemnity to recover his costs and outlays.

[270] After the twelve year period, the defender is no longer obliged to correct defects. During the period between take over and the issue of the defects certificate, any loss or damage caused by the works is governed by clause 80.1. Following the issue of the defects certificate, any loss or damage to the works is an employer's risk event.

[271] On the hypothesis that the pursuers had demonstrated that the 75 year design requirement had not been complied with, that would have to have been because of a defect in the accepted design (presumably ultimately a failure to line the tunnel throughout the CFZ). If they had proved that there had been a failure to shotcrete erodible rock, the failure would have been one in implementing the accepted design (on the hypothesis that it required this precaution). This would still fit into the description of a defect due to the contractor's "design", which is unqualified by reference to the wording which defines a defect. It is not suggested that those carrying out the support work in the HRT failed to comply with Mr Taylor's requirements. What he designated by way of HRT support is properly classified as part of the contractor's design when considering Option M. Clause 11.2(15) refers to a defect occurring where a part of the works designed by the contractor does not accord with the accepted design. The defenders thus escape liability for a defect, even if it existed at take over, if they can prove (as in the event they did (*infra*)) that they used reasonable skill and care in the design of the HRT.

[272] Although the point was not pressed, for completeness, the pre-watering up inspections did not constitute an "event" within the meaning of clause 80.1. They were simply part of the works themselves.

Burden of proof

[273] The incidence of the burden of proof is only significant if a judge at first instance is unable to reach a concluded view on the facts, having heard the evidence (*Thomas v Thomas* 1947 SC (HL) 45, Lord Thankerton at 54). In the vast majority of cases, such a view can be reached notwithstanding the absence of direct testimony on a particular matter. As has often been said, onus seldom matters once the evidence is out (eg *Salt International v Scottish*

Ministers 2016 SLT 82, LJC (Carloway) at para [45]; *Gibson v BICC & Co* 1973 SC (HL) 15, Lord Reid at 22).

[274] One curious, albeit by no means unique, feature of this case is that what might otherwise have been regarded as the crucial testimony on the issue of negligence, notably but not exclusively that of Mr Taylor, was not adduced by the defenders, upon whom the onus lay. There was no material produced to suggest that Mr Taylor could not be found and duly cited to appear at court. It must be assumed that the decision of the defenders not to call him was a deliberate one, even if the precise reason for that is not known to the court. If the defenders had had any difficulty in tracing Mr Taylor, they could have sought the court's assistance, especially in circumstances in which the pursuers knew of his whereabouts.

[275] Where an incident occurs and the party upon whom the onus lies does not lead his protagonist, there can be no doubt that the court can draw an inference adverse to that party's interests from that absence. The court would be entitled to find that the matter upon which that 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 party's case was thus made out (see eg *Binnie v Rederij Theodoro* 1993 SC 71, LP (Hope) at 87). In this context, there is considerable force in the pursuers' submission that the absence of Mr Taylor, and indeed the Jacobs and Pöyry geologists, ought to have been fatal to the defenders' case on this issue.

[276] However, as a generality, where there is some evidence pointing to a particular fact, a judge will normally be expected to decide whether that fact has been proved in the absence of an important, or even the central, witness or witnesses. Deciding a case on onus is the exception rather than the rule. It ought to be regarded almost as a last resort when

some such evidence is present. A judge has a duty to decide the case on the evidence adduced and to avoid doing so on the basis of onus if there is some evidence which does support one or other or both of the parties' contentions (see eg *The Popi M* [1985] 1 WLR 948, Lord Brandon at 955). The issue in this case is whether, albeit that the commercial judge would have been justified in deciding the case in favour of the pursuers on the basis of onus, he was bound to do so. The answer to that is in the negative.

[277] The absence of Mr Taylor must certainly be regarded as significant. It could have been regarded as determinative. However, there was evidence before the commercial judge about what Mr Taylor had done, when assessing the geological conditions in the tunnel, and about the care and attention which he had paid to his task. In particular, there were his REC sheets and mappings, which were completed in some detail and spoken to by others. There was, *quantum valeat*, the testimony from the TBM crew about the care which Mr Taylor took and some evidence from several witnesses about his general level of skill and care. Most significant, there was the fact that none of the other experienced engineering geologists, who were in the HRT before its collapse, criticised Mr Taylor's judgment on site. In addition, there was testimony from several, albeit not all, of the experts to the effect that Mr Taylor's assessment of the necessary rock support could not be faulted.

[278] The pursuers were able to point to questions arising from the form and content of the documents produced which, they submitted, could only have been answered by Mr Taylor. These will each be analysed on their individual merits (*infra*). Suffice it to say, this was not a case in which the facts could not be determined in the absence of Mr Taylor. It was not a case in which there was no evidence of what he had found and what he had decided. That evidence came from the content of the documents produced and spoken to by witnesses. There was testimony from which an inference could be drawn that reasonable skill and care

had been taken. *Hills v Niksun* [2016] IRLR 715 involved quite different circumstances in which there was no evidence at all of the considerations upon which a decision had been based. Here, there was evidence of what had, at least apparently, been seen and taken into account when making the decisions on rock support.

Reasonable skill and care

[279] The determination of whether the defenders exercised reasonable skill and care may be classified as one of law. It is nevertheless heavily dependent upon findings of primary fact in relation to: (i) the rock mass observed, or observable, in the HRT; (ii) the bases upon which decisions regarding support in the HRT were to be made; and (iii) the decisions which were made in the HRT.

[280] The court must bear in mind the limitation of its jurisdiction to reverse findings in fact, having regard to the *dicta* in the trio of cases in the United Kingdom Supreme Court (*McGraddie v McGraddie* 2014 SC (UKSC) 12; *Henderson v Foxworth Investments* 2014 SC (UKSC) 203; and *Royal Bank of Scotland v Carlyle* 2015 SC (UKSC) 93), which heavily influence how the traditional approach outlined in *Thomas v Thomas* 1947 SC (HL) 45 (Lord Thankerton at 54) ought to be perceived.

[281] Findings of primary fact can only be interfered with by an appellate court where the judge at first instance can be shown to have been “plainly wrong”. That much is clear. This has been interpreted as meaning that the judge must have reached a decision which no reasonable judge could have reached (*Henderson v Foxworth Investments (supra)* Lord Reed at para 62) or that his decision cannot reasonably be explained or justified (*ibid* at para 67). As was said in *HS v FS* 2015 SC 513 (LJC (Carloway) at para [22]):

“The court does not understand Lord Reed to be seeking to depart from the familiar and long-settled approach of the Scottish courts hitherto in appeals on matters of

fact. Although some of the wording ... might, if looked at in isolation, be taken to suggest an approach redolent of the high test applicable in cases of judicial review, it is clear from Lord Reed's careful analysis of the *dicta* in *Thomas v Thomas* that what he was doing was explaining in more modern language the meaning of 'plainly wrong'. This is consistent with his observation in *McGraddie v McGraddie* (para 5) that: 'While the law is not in doubt, its application has been inconsistent''.

[282] Although the matter may have become one of some controversy in recent years at least in the Inner House of the Court of Session, an appellate court can more easily reverse a judge at first instance when what is under review is not a finding of primary fact but an inference (or secondary fact) drawn from the primary fact or facts (cf *Housen v Nikolaisen* [2002] 2 SCR 235; see also *Royal Bank of Scotland v Carlyle* 2014 SC 188, LJC (Carloway), delivering the Opinion of the Court, at para [60]). It may do so with even greater confidence if what is under consideration is the application of the law to the facts, whether primary or inferential (see generally the analysis in "*Appellate courts: Parts 1, 2 and 3*" 2015 SLT (news) 125, 130 and 138).

[283] On the one hand, the advantages enjoyed by a judge at first instance in having seen and heard the witnesses should not be underestimated. Furthermore, an appeal court must have due regard to the limitations of the appeal process with its "[narrow focus] on particular issues as opposed to viewing the case as a whole" (*McGraddie v McGraddie (supra)* Lord Reed at para 33, citing *Housen v Nikolaisen (supra)* at para 14; see also *Royal Bank of Scotland v Carlyle (supra)* Lord Hodge at para 22). On the other hand, the considerable benefits of a three (or more) judge bench in terms of differences in view, varieties of legal background and dialogue should not be overlooked (see *Appellate courts: Parts 1, 2 and 3 (supra)* at 127). The position of the Court of Session as a unitary court hearing reclaiming motions from Outer House judges exercising delegated functions is also an important

consideration in assessing the scope of the peculiarly Scottish appellate jurisdiction (*ibid*).

The Inner House is not a separate appellate court as may be found in other jurisdictions.

[284] With these cautionary words borne firmly in mind, it is not possible to conclude that the commercial judge has erred in finding that the defenders did exercise reasonable skill and care.

[285] In the appellate process, the pursuers have founded upon very specific examples, which they maintain demonstrate negligence. The pursuers' submissions in relation to the deficiencies, which were said to have existed in the manner in which the design was implemented (or continued) in the HRT, have, once more, considerable force. It is incorrect to state, as the commercial judge did, that none of those in the tunnel had recommended the installation of a higher level of support at particular locations. At the time of the inspections in January and February 2008, Pöyry had recommended additional support in certain areas. Nevertheless, the judge was correct in his critical finding that no-one had identified a fault that presented a threat to the HRT's stability. The problems which had been identified by Pöyry had been dealt with in the "closing off" of defects notice DN033, dated June 2008.

[286] Although Dr Palmström did agree with counsel that there had been a "missed opportunity" in October 2008, when concerns had led to defects notice D041, this does not advance matters, given that what was happening at that stage was not a study of the rock mass by engineering geologists but an inspection to see that there was no dangerous debris which might damage the turbine during watering up. Subject to what follows in relation to the reliance on documents not spoken to by their authors, the judge was entitled to found upon what Mr Fawcett had written in his report dated 16 April 2010 *viz.*: "There is no recorded evidence of passing through any feature that would potentially cause the

catastrophic collapse that has occurred". He was equally entitled to found upon Mr Speirs' minute of 9 September 2007 that signs of the CFZ were imperceptible.

[287] The pursuers have undoubtedly pointed to features of the rock in the vicinity of the collapse which, at least to a non-expert eye, may appear to provide strong clues about what had occurred and why. The commercial judge's assessment of the cause of the collapse is not under significant challenge. Dr Wilhelm's reconstruction in hindsight (*supra*) paints a dramatic picture, which was broadly accepted by the judge, of submerged weak rock deteriorating, erodible areas being washed out, opening up larger interconnected seams and ultimately causing a catastrophic loss in stability.

[288] The pursuers were able to point to what was recorded at chainages 2117-2101¹⁰ about the findings of kakirite and the references to particular angled shears in the blocked zone at chainages 2121-2050. They founded upon the ticks on the REC sheet for chainages 2084 to 2082¹¹. They were able to pose the question of why these areas were not provided with class III or IV support given the terms of the RSM; notably Table 11. However potentially objectionable the questions and inadequate the answers may have been, the defenders' experts, notably Drs Büchi and Palmström, did provide a response to these questions. It was, in essence, that, given Mr Taylor's expertise, having specifically noted these features, he could not have thought that they were of such significance as to require an increased level of support. The judge was entitled to rely on this explanation and on the undisputed fact that, at the time of excavation at least, none of the other engineering geologists from Pöyry or Jacobs disagreed with Mr Taylor's assessments of rock mass and support.

¹⁰ Appendix 5 to this Opinion

¹¹ Appendix 7 to this Opinion

[289] The pursuers were able to question whether those inspecting the tunnel at the excavation stage had considered Table 11¹², given that it did not feature expressly on the REC sheets¹³. They were able to suggest that the operation of the tunnel under hydraulic pressure was not what Mr Taylor and his fellow geological engineers had in mind when deciding upon the level of support. The evidence of Dr Broch at the Adjudication pointed to this as a possibility, at least on a Norwegian model. Notwithstanding these points, the commercial judge was entitled to hold that, the contention that operational circumstances had not been considered during excavation, was a “startling proposition”. He was entitled to rely on Prof Müller and Dr Wilhelm in this regard, since they had testified that those on the ground had been thinking about the operation, and not just the excavation, of the HRT. The terms of Mr Taylor’s email of August 2007 did not suggest otherwise. The judge was entitled to reject the pursuers’ contention that what was being carried out was a two stage process of, first, excavating a tunnel which was safe in plain air conditions and, only then, considering separately operational concerns. No-one involved in the construction of the tunnel spoke to such a plan and it was not reflected in the contract documents.

[290] The commercial judge did not require to make an express finding that Table 11 had been considered, given his general findings about the approach of Mr Taylor and the other engineering geologists on site. There was no reason to suppose that the geologists had been unaware of the central documents in the works information and detailed design. Mr Taylor must have been aware of them, given the form of the REC sheets, even if the wrong Table was referred to in the template of the HRT sheet. The language used to identify the rock class was consistent with awareness of the terms of the relevant documents. The term

¹² Appendix 3 to this Opinion

¹³ Appendix 4 to this Opinion

“erodible rock” did not require a definition. It seems to have been generally understood. The judge was correct to hold, as was indeed the case (*supra*) that Table 11 did not contain a requirement that all erodible rock required to be shotcreted. The various experts were generally, but not unanimously, agreed that the RSM was appropriate to determine rock class. The judge was entitled to hold that what had been envisaged by the works information and the accepted design was a method whereby an engineering judgment was to be made at the face of the excavation in relation to support at particular locations.

[291] Given that this process was being overseen by both Pöyry and Jacobs, it is a reasonable conclusion that what Mr Taylor was doing was making a decision which, at least as the parties must have thought at the time, accorded with the contract. It did not involve “painting by numbers”, or a “mechanistic” or “tick box” approach. Just because there was some erodible rock or kakirite observed, or a shear of just under 50° recorded, did not mean that 360° shotcreting was automatic. The judge was entitled to pose the rhetorical question of why the engineers should record rock conditions in such a detailed manner and then do nothing about them; thus assuming the answer that they had taken all these matters into account when making engineering judgments based on the totality of the rock mass observations at the particular locations. The general absence of criticism of the engineering judgments, once accepted, was all but a fatal blow to the case of negligence, and warranted the judge rejecting the testimony of Prof Sloan on this point.

[292] The inspections in October and November 2008 had led to defects notices DN041 and DN044. It is true that there were concerns about debris and voids in the invert, where rock had been eroded, but the commercial judge did not consider that the problems identified had involved major issues affecting stability, as distinct from matters which could be dealt with at the stage of dewatering in due course. Again, given the absence of any engineering

geologist stating at the time that there were identifiable features which could lead to a collapse, this was a finding which he was entitled to make, notwithstanding the power of the submission to the contrary.

[293] The pursuers advanced an argument that it was possible that the defenders had not appreciated exactly where the CFZ¹⁴ had been located on the HRT chainages. There may have been a difference of opinion on this at one point, but Mr Taylor had made his own views clear on where the CFZ would lie and what the related dangers for the TBM crew were. His location was broadly accurate. The significant fact, and one which the commercial judge was entitled to find on the evidence, was that there was no sign of the CFZ, as the TBM progressed through its anticipated location, such that additional support measures were required. The judge was entitled to find that the experienced TBM crew did know what they were doing and could identify different rock classes, even if Dr Smith thought that they might have been ignorant of the true conditions.

[294] The proposition that Pöyry had not examined the CFZ in January and February is not supported by the evidence. Their inspections had led to the very substantial defects notice D033 covering the relevant area. Even if they had failed to examine particular areas, the evidence of Prof Broch made it clear that, on his inspection/walk-through of the HRT, there was nothing significant which could have been found which would have predicted a major collapse.

[295] In conclusion, it cannot be said that the commercial judge was “plainly wrong” in concluding that the defenders had exercised reasonable care in relation to their design of the HRT and in determining, at the face, how it was to be implemented. His decision can reasonably be explained and justified on this central aspect of the proof.

¹⁴ see Appendix 2 to this Opinion

Adequacy of reasons

[296] A judge requires to provide reasons for a judgment in a contested litigation in order to demonstrate that justice has been done, and has been seen to have been done. The parties are entitled to know how the judge has decided their case. This will normally involve setting out the facts which have been admitted or proved and, where there has been a dispute, the evidential basis for the facts found. The legal issues raised by the parties have to be identified, usually in the form of a succinct summary of the submissions made. The manner in which these issues have been resolved requires to be explained. This ought, if possible, to be done in a concise manner which will be understandable, not just to the lawyers involved in the litigation but also, at least, to the well informed reader of reasonable intelligence, and the parties themselves. As was said in *MacLeod's Legal Representatives v Highland Health Board* 2016 SC 647 (Lord Brodie, delivering the Opinion of the Court, at para [93]):

“the summarising and marshalling of points at an appropriate level of generality with a view to focusing what is relevant to a resolution of the issues and not getting lost in detail is an important judicial skill.”

[297] Regard must be had to the different potential readers; primarily the parties, but also other interested persons, where the point is one of public and/or legal interest, and any appellate court (*ibid*). A process of recording the evidence and submissions *verbatim* should be avoided in favour of a considered selection of what is relevant, important, concise and coherent. Although a judicial opinion will often require to be more structured and detailed than those of administrative tribunals, the standard in the latter, which requires that the reasons given must at least “leave the informed reader and the court in no real and substantial doubt as to what the reasons for it were and what were the material

considerations which were taken into account in reaching it" (*Wordie Property Co v Secretary of State for Scotland* 1984 SLT 345, LP (Emslie) at 348), is a valuable starting point for any assessment of adequacy.

[298] The commercial judge adopted a style which ought to be regarded as a sound example of how a written Opinion at first instance ought to be composed in a case of this considerable magnitude. It must be borne firmly in mind that, although a judge's reasoning must always be adequate, the parties are entitled not only to that reasoning, but also to a decision within a reasonable time. In this case, the judge made *avizandum* on 22 April 2016 and advised the case by the end of the year. Given that he would have had many other cases to decide and duties to perform during that period, that was a remarkable achievement where the parties had, as the judge observed, lodged 73,000 documents and there were transcripts of testimony given over many months to be poured over. The judge commented, not unreasonably, that it was unfortunate that the parties had been unable to narrow the scope of the proof and at least to have lodged an agreed chronology and a list of issues. The less parties assist the court in focusing the issues of fact and law, the more difficult it is for the judge to reach a reasoned decision and to do so within a reasonable time.

[299] On the issues at proof, the commercial judge produced 72 pages of text, together with an appendix containing drawings and photographs which illuminate his writing. He set out, *in limine*, the structure of his Opinion in separate sections which make it clear to the reader exactly what is being dealt with at the particular point. He identified the general issues in an introduction. He provided a chronology of events, starting with the scheme and going on to describe the contract, the construction, its collapse and the recovery project. He had specific sections on why the tunnel collapsed, the witnesses and burden of proof,

whether (in relation to the works information or the design) there was a defect at takeover and reasonable skill and care. He dealt separately with whether the defenders ought to have returned to site, contributory negligence, causation, the costs of recovery and individual heads of damages, before considering the counterclaim and ending with clear conclusions.

[300] In each of these sections the reasoning of the commercial judge is generally clear and concise. It leaves the reader in no doubt about what his reasons for reaching a particular view were. That is not to say that the reasoning is as clear as it might have been on all the points raised, or that it might have been more expansive in certain areas, but it meets the legal test. At no point does it take on the character of an oracular pronouncement (*Dingley v Chief Constable, Strathclyde Police* 1998 SC 548, LP (Rodger) at 554 quoting from *Davie v Magistrates of Edinburgh* 1953 SC 34, LP (Cooper) at 40). It should be borne in mind that the proof was transcribed instantly by “Live-Note”. There was no need for a detailed rehearsal of what all the witnesses had said, even if some detail has been necessary in the context of the reclaiming motion, given the specific focused criticisms of the judge’s approach to particular aspects of the evidence. The court has not found the absence of such a rehearsal a significant disadvantage in determining the reclaiming motion.

Reliance on documents not spoken to

[301] The Civil Evidence (Scotland) Act 1988 provides that:

“2(1) ...

- (a) evidence shall not be excluded solely on the ground that it is hearsay;
- (b) a statement made by a person otherwise than in the course of the proof shall be admissible as evidence of any matter contained in the statement of which direct oral evidence by that person would be admissible; and
- (c) the court..., if satisfied that any fact has been established by evidence in those proceedings, shall be entitled to find that fact proved by the evidence notwithstanding that the evidence is hearsay.”

“Statement” includes “any representation (however made or expressed) of fact or opinion” (*ibid* s 9).

[302] In terms of the joint minute, it was agreed that a number of specific witness statements would be treated as “evidence in the cause”. It was then provided that:

“3. Save to the extent that evidence to the contrary has been heard or it is otherwise agreed, it is to be presumed that:

(i) all productions and electronic documents are what they bear to be ...”.

[303] One of the purposes of the abolition of the prohibition against hearsay in civil proceedings was to permit the use of documents as evidence in the absence of oral testimony from their authors. It may be that, in certain circumstances, a judge will attach little weight to a statement when the maker is available to testify, but that is a matter for judgment. Hearsay, in the form of a document not spoken to by its author, is admissible as proof of fact and it is for the judge at first instance to assess its weight. Where there is evidence, oral or otherwise, to contradict it, the content may be rejected, but the opposite may equally be the case. The hearsay may be accepted as more credible and reliable in the face of contrary testimony, depending upon the circumstances.

[304] Where it is agreed that a document is what it bears to be, the content of the document is evidence *in causa*. If the provenance of the document points to the accuracy of the content, that content may be preferred to other evidence, including testimony. Thus, where it is accepted that the REC sheets and the mapping were “what they bear to be” and various witnesses spoke to the accuracy of Mr Taylor’s work, the content of these documents can be accepted as true and accurate even in the absence of their author. Both parties appear to have proceeded on that basis, at least for certain purposes. Similar considerations apply to Mr Taylor’s emails and to Mr Speirs’ minute. The commercial judge could have decided

to discount the content of the minute, on the basis that Mr Speirs had not been called, but he was not bound to do so and ought only to have done so if there was some reason to call its content into question.

[305] The report from Mr Fawcett falls into the same evidential category. It was open to the commercial judge to take into account what an expert in tunnelling had reported, in the context of the other evidence, and to use it to support the conclusions which he ultimately reached. It was for the judge to determine whether the absence of its author, notably for the purposes of cross-examination, was of significance in all the circumstances.

[306] In *McEwan v Lothian Buses* [2014] CSIH 12, there was a written statement from the defenders' bus driver which described the relevant road accident. It is not entirely clear from the Opinion (paras [3]-[4]) whether this document was one of those which was agreed by joint minute as being "what it bore to be". The Opinion states (paras [4] and [18]) that there was "no agreement ... about the evidential status of the document", but if that were so, the purpose of mentioning the terms of the joint minute would be obscure. If it had been so agreed, it would have become a hearsay statement whose evidential value would have to have been weighed in the balance and not automatically excluded. As it transpired (para [18]), no one spoke to the provenance of the document and it is not surprising that it was not regarded as material. That is not the position in this case.

[307] In any event, neither the content of Mr Speirs' minute nor the conclusion of Mr Fawcett's report were contradicted by Dr Wilhelm's *ex post facto* reconstruction of the collapse. The absence of visible features indicative of a potential collapse is not inconsistent with the occurrence of the collapse as a result of the unseen interlinking of shears above the crown of the HRT. Equally, in relation to the evidence of Dr Broch and Prof Sloan and that concerning the DAT, the weight to be given to the various adminicles, including the hearsay

provided by the experts, remained matters for the commercial judge to assess. Once again, it cannot be affirmed that his assessment was “plainly wrong”.

Causation

[308] For reasons similar to those already given in relation to the commercial judge’s findings on reasonable skill and care, he was entitled to hold that the use of such skill and care would not have prevented the collapse. He found (para [260]) that only the installation of class IV support would have done so. The pursuers had only said (paras [165] and [195]) that class III ought to have been provided in the exercise of such skill and care. As the pursuers submitted, this may not matter in a situation in which the defenders were ultimately liable to meet the costs of correcting any defect. However, for the reasons already given, that is not what the contract said. The inescapable consequence is that, at least in so far as the pursuers rely upon a breach of contract based on a failure to shotcrete erodible rock, they have failed to prove that the collapse was caused by that breach and hence the essential link between the breach and the loss or damage.

Secondaries

[309] Whether the secondaries were defects was primarily a matter of fact, albeit in a contractual context. The commercial judge provided several reasons for concluding that the areas identified by Prof Sloan were not defects. First, no-one had identified them as such in 2008. This was a point of some force. Any defects as were identified would have been recorded in defects notice DN033, which was closed off, or DN041 or DN044 in November and December 2008. Secondly, the judge accepted the evidence of Mr Becker that, when he looked at the relevant areas some time after April 2010, the features could not be classified as defects. Thirdly, he accepted the evidence of Prof Broch, who had looked at the areas in

January 2011, that the features were either rock falls, which could be left unsupported, or expected minor rock falls. Fourthly, he accepted Dr Billig, who was more or less to the same effect in relation to an absence of any threat to stability. The judge's conclusion here can reasonably be explained and justified.

[310] The pursuers maintain that they were entitled to adopt what might be described as a precautionary approach to the features and argue that, if the areas required repair, they ought to recover any cost of doing so. However, this claim is that the features constituted defects requiring correction in terms of the contract. If the tunnel was stable, despite the existence of these features, there was nothing which could constitute a defect in terms of the contract and this part of the claim would be bound to fail.

Clause 82.1 damages

[311] The ingenuity of relying on the defenders' assessment of the cost of repair at £30 million or thereby, and arguing that therefore the pursuers could claim the balance between that and the sums paid to BAM as the measure of their loss by virtue of the defenders' failure to do the work in breach of clause 82.1, is immediately acknowledged, but it must as quickly be dismissed. The evidence of Mr Hunter, which had vouched the £30 million figure, was rejected by the commercial judge for reasons which were not challenged. That left, as the only evidence of the costs of repair, that presented by the pursuers. In the absence of any acceptable evidence that the costs would have been less than those reasonably incurred by instructing BAM, the commercial judge was bound to hold that such costs would have been the same, had the defenders themselves carried out the work.

[312] Conversely, the commercial judge was entitled to the view that the pursuers had not placed unlawful conditions on the defenders by insisting upon a concrete invert, the DAT and a BPT. Each of these aspects of the recovery project was justified by the evidence. The invert was a requirement of the Health and Safety Executive. The DAT was to yield benefits in terms of ventilation, access and safety, even if it did not achieve the objective of driving the BPT from both ends. The BPT had been agreed as the sensible solution, given the obvious dangers involved in driving through the collapsed zone. The judge readily justified his approach in these areas.

Expenses (ground 14)

[313] An award of expenses is a matter for discretionary judgment by the court of first instance. Appeals, at least when dealing only with expenses, are “severely discouraged” (*Caldwell v Dykes* (1906) 8F 839, LP (Dunedin) at 840) and entertained only in very exceptional circumstances such as where, for example, some obvious miscarriage of justice has occurred (*Charles Rogers & Sons v G & H Mullen* 1957 SLT 23, Lord Mackintosh at 25). The court will only interfere where the court at first instances has taken into account something which it ought not to have done, left a material matter out of account or reached a decision which was “plainly wrong” (*Ramm v Lothian and Borders Fire Board* 1994 SC 226, LJC (Ross), delivering the Opinion of the Court, at 227).

[314] One matter which does requires to be taken into account is the incidence of success, given that the general rule is that expenses should follow the result. In a damages claim, that is usually measured in a straightforward way by determining whether the pursuer has succeeded in obtaining an award in his favour; a defender being in a position, if concerned about expenses, to lodge an appropriate tender. Where, as here, the pursuers had secured a

substantial award of around £1.5 million, that ought normally to be used as a starting point and the absence, as here, of any tender would be an important matter (*ibid*), albeit that an award of expenses may be refused or modified if the successful party's evidence or conduct has been unsatisfactory (*ibid* at 228). The approach of the sheriff, rather than the sheriff principal, in *D Macdonald & Bros v Cosmos Decorators* 1969 SLT (Sh Ct) 9 is the norm (see also *Howitt v Alexander & Sons* 1948 SC 154 and *William Nimmo & Co v Russell Construction & Co* (No. 2) 1997 SLT 122, Lord Morison, delivering the Opinion of the Second Division, at 122). The court does not normally engage in an exercise of deducting portions of expenses in accordance with its view of how much time was taken up in dealing with a point which turned out to be of no value or effect (*ibid*). That approach may, however, not be followed strictly in a case of particularly long duration.

[315] Even when a party has been successful, in the manner described, expenses may be refused or modified and a contra award may be appropriate in all the circumstances (*Howitt v Alexander & Sons* (*supra*), LP (Cooper) at 158). In this case the commercial judge took the view that almost the entire proof (and the case in general) had been taken up with matters upon which the defenders were successful. It may be surprising that the judge made an award almost entirely in the defenders' favour, given that the pursuers had achieved some success, not only in securing an award, but also in discreet areas; notably in resisting the defenders' own pleas of contributory negligence and in the counterclaim and quantification. However, the judge was undoubtedly in the best position to assess those matters (*Ramm v Lothian and Borders Fire Board* (*supra*) at 229). Even if it may be said that the judge could have expressed it in more expansive terms, the reasoning which he gives, and which is broadly consistent with the nature of the pleadings and the extent of the proof, is readily understandable and justifiable. The deduction of 5% may seem very small in relative terms

(representing only about 2½% of the total expenses of both parties) but, as was submitted, it may amount to a considerable sum.

[316] Having regard to all the circumstances, there is no material error in the commercial judge's decision on this issue.

Cross appeal

Joint insurance

[317] The obligation was for the defenders to provide insurance in the joint names of the parties in respect of (amongst other things) loss of, or damage to, the works caused by events which were at their risk prior to the issue of the defects certificate (clause 84). All risks, which were not those of the pursuers (typically claims due to the pursuers' fault or negligence (clause 80.1)), were carried by the defenders (clause 81). The insurance would encompass damage to the tunnel, whether caused by the contractors, third parties or other external factors. In the same part of the contract as the provision regarding insurance was that relating to indemnity. Each party required to indemnify the other against claims due to an event which was at that party's risk (clause 83.1), with the liability reduced if the events were contributed to by the other's risk (clause 83.2).

[318] If the tunnel collapse had been due to a breach of the contract on the part of the defenders, the pursuers' argument was that they could sue the defenders for the resultant loss, even although the defenders may have insured themselves and the pursuers in respect of that loss. The practical consequence of this could be that the pursuers would recover a sum equivalent to that which their insurers had already paid out (or were liable to pay) to them and which they would presumably be obliged to return. The circularity of this does not pose a problem in practical terms if the basic principle that insurance is *res inter alios acta*

were to be applied. Any pointless litigation could be marked by an appropriate award of expenses. The insurmountable difficulty with this straightforward approach, however, is the highly persuasive authorities which dictate otherwise where the insurance is joint.

[319] The UK Supreme Court decision in the "*Ocean Victory*" [2017] 1 WLR 1793 was decided after the commercial judge's Opinion. It refused the appeal from the judgment of the Court of Appeal, which the judge had considered. Although the judgments of the UK Supreme Court are *obiter* on this point, it was not contended otherwise than that a joint insurance clause precluded an action for damages covered by that insurance. Both the majority and the minority considered that this was because, as a matter of construction, there was a resultant implied term in the contract to that effect (Lord Toulson at paras 139-144, Lord Mance at para 114; Lord Sumption at para 99).

[320] The commercial judge's view (para [81]), that there was no reason in this case to give primacy to the insurance clause (clause 84) over the indemnity provision (clause 83), is correct. Taking out a joint insurance policy had utility and was prudent, but there was no reason to suppose that it would supplant liability. The presumption in *CRS* (*supra*, Lord Hope at para 65), that there is an implied term in a contract preventing litigation between the parties, where there is joint insurance, can be rebutted having regard to the terms of the contract. That is the situation with this contract. There was certainly no necessity to imply such a term for the purposes of business efficacy. *CRS* (*supra*) turned, at least in part, on the use of the term "liable" in section 1 of the Civil Liability (Contribution) Act 1978 (not applicable to Scotland) and on the fact that the liability on the contractors had been expressly excluded. The situation is different when the contract envisages that one co-insured may be liable to the other in damages within the cover provided by the policy (*Tyco Fire v Rolls-Royce Motor Cars* [2008] Lloyd's LR 617, Rix LJ at para 77).

Breach of clause 82.1

[321] Clause 82.1 required the defenders to replace the loss of, and to repair damage to, the works. It did not restrict itself to loss or damage due to a defect as defined. It is an obligation to replace and repair, whatever the reason for the loss or damage. There can be little doubt that the collapse of the tunnel resulted in loss or damage to the works. The defenders were bound to replace or repair the damage. They did not do so; indeed they refused to do so and were thereby in breach of this important contractual provision. That breach occurred irrespective of where the risk fell, in terms of clause 80.1, so far as the provisions for indemnity (clause 83.1), and hence payment, were concerned.

[322] The defenders' counterclaim is predicated on the proposition that they were entitled to carry out the works and that the pursuers had prevented them from doing so. However, from the commercial judge's findings in fact, it cannot be concluded that this was so. The pursuers had instructed the defenders to carry out remedial works by letter dated 31 August 2009 under reference to defects notice DN053. The response from the defenders, in their letter of 25 September 2009, had been that they were "ready" to repair the collapse, as they had recognised that they were required to do so in terms of clause 82.1. However, it was the defenders who had imposed a condition, which was not stipulated in the contract, that the pursuers should agree to pay for the remedial works in advance; ie before the issue of risk could have been determined. Furthermore, they had insisted in their letter of 12 November 2009 that they should be paid on a cost reimbursable basis. They refused to proceed on an *interim* 50:50 cost sharing basis.

[323] In these circumstances, the commercial judge correctly determined that the defenders could not found on clause 82.1 to claim loss of profits in circumstances in which they had refused to perform their obligation under that same clause.

The counterclaim

[324] The claim for loss of profit fails for the reasons given in relation to mutuality of obligations under clause 82.1. The defenders had refused to carry out the repair work and had not been prevented from doing so.

[325] The indemnity provision of clause 83.1 relates *inter alia* to costs due to an event which is at the party's risk. In this case the risk event was loss of, or damage to, the works under clause 80.1 (not falling within the exception). The question becomes one of whether the costs claimed are due to the tunnel's collapse. It is not disputed that the collapse has to be the "effective", as distinct from a "but for", cause (*ENE Kos I v Petroleo Brasileiro (No. 2)* [2012] 2 AC 164, Lord Sumption at para 12).

[326] The defenders' monitoring of the BAM works was not, as the commercial judge correctly held, effectively caused by the tunnel's collapse. The defenders did not require to monitor the works because of the collapse. They elected to do this for their own purposes; no doubt with an eye to potential litigation. Similarly, the defenders' decisions to refer some of the issues to two adjudications were not caused by the collapse. They were voluntary acts made in order to secure payment of sums, of the type now claimed, and to obtain a provisional view on liability. The defenders' expenses in this litigation are not effectively caused by the collapse but by the pursuers' act in deciding to sue them.

[327] For the reasons essentially given, albeit in short form, by the commercial judge, the counterclaim fails.

Repayment of the second adjudicator's award

[328] If an adjudicator has made an award, which is later determined by the court to have been wrong, it follows that the sum must be repaid (*Aspect Contracts v Higgins Construction* [2015] 1 WLR 2961, Lord Mance at paras 23-24). That is the position here where the court has determined that the sums awarded under clause 83 ought not to have been awarded given the breach of clause 82.1.

Low availability damages

[329] Clause 48 provided that, if the scheme was not operating after completion, the contractor was required to pay certain sums to compensate for "low availability" up to a ceiling of £1 million. As the commercial judge determined, this sum was due under this clause. However, if it was caused by the tunnel collapse, the pursuers would be liable to compensate the defenders for this under clause 83.1. The delay, or at least a significant part of it, which produced these damages, was not caused by the collapse but by the defenders' failure, in breach of their obligation under clause 82.1, to proceed "promptly" with the recovery project. As was submitted, the investigations ought to have been completed by mid-December 2009 but they had not even commenced until then. There may not have been a precise calculation of the damage sustained as a result of the delay but, as the judge held, it "vastly exceeded" the £1 million cap.

Quantum (and DAT)

[330] The commercial judge explained that, in his assessment of damages, he had adopted the approach taken in *Banco de Portugal v Waterlow & Sons* 1932 AC 452 (Lord Macmillan at 506) viz.:

“The law is satisfied if the party placed in a difficult situation by reason of the breach of a duty owed to him has acted reasonably in the adoption of remedial measures, and he will not be held disentitled to recover the cost of such measures merely because the party in breach can suggest that other measures less burdensome to him might have been taken.”

It does not now appear to be disputed that the pursuers did pay the sums claimed to BAM as part of the recovery project. There is no reason to suppose that the pursuers were other than business-like in their approach to the contract with BAM, albeit against a background of wishing to ensure that the tunnel did not collapse again. The judge held, as a matter of fact, that the pursuers had acted on the basis of professional advice and had instituted an exacting costs monitoring regime. The BAM contract, which was under Option E, was the only basis upon which the defenders themselves would have contracted. In these circumstances, it is not possible to fault the judge’s conclusions on reasonableness.

[331] The pursuers required to establish, not “causation”, but that what they had done had been reasonably required to put them back in the same situation as if the collapse had not occurred. That was established in terms of the commercial judge’s general findings on how the pursuers had approached the recovery works. It was sufficient to prove the actual costs of these works, especially given that the judge had also found that BAM’s profit margin had been very limited, and that they were reasonable.

[332] The decision to complete the works with dispatch was one aspect of the pursuers’ decision making which the commercial judge held was reasonable in the circumstances.

Whether or not loss of profit was allowable in terms of the contract, the pursuers were entitled to proceed in a manner which kept their on-going losses to a reasonable minimum.

It may be that the defenders, and their witnesses, were of the view that the DAT was unnecessary, but the judge was entitled to the view that it formed part of the necessary

remedial works and brought benefits in terms of ventilation, access and safety. Its construction did not fall under the £1 million cap in clause 48.1.

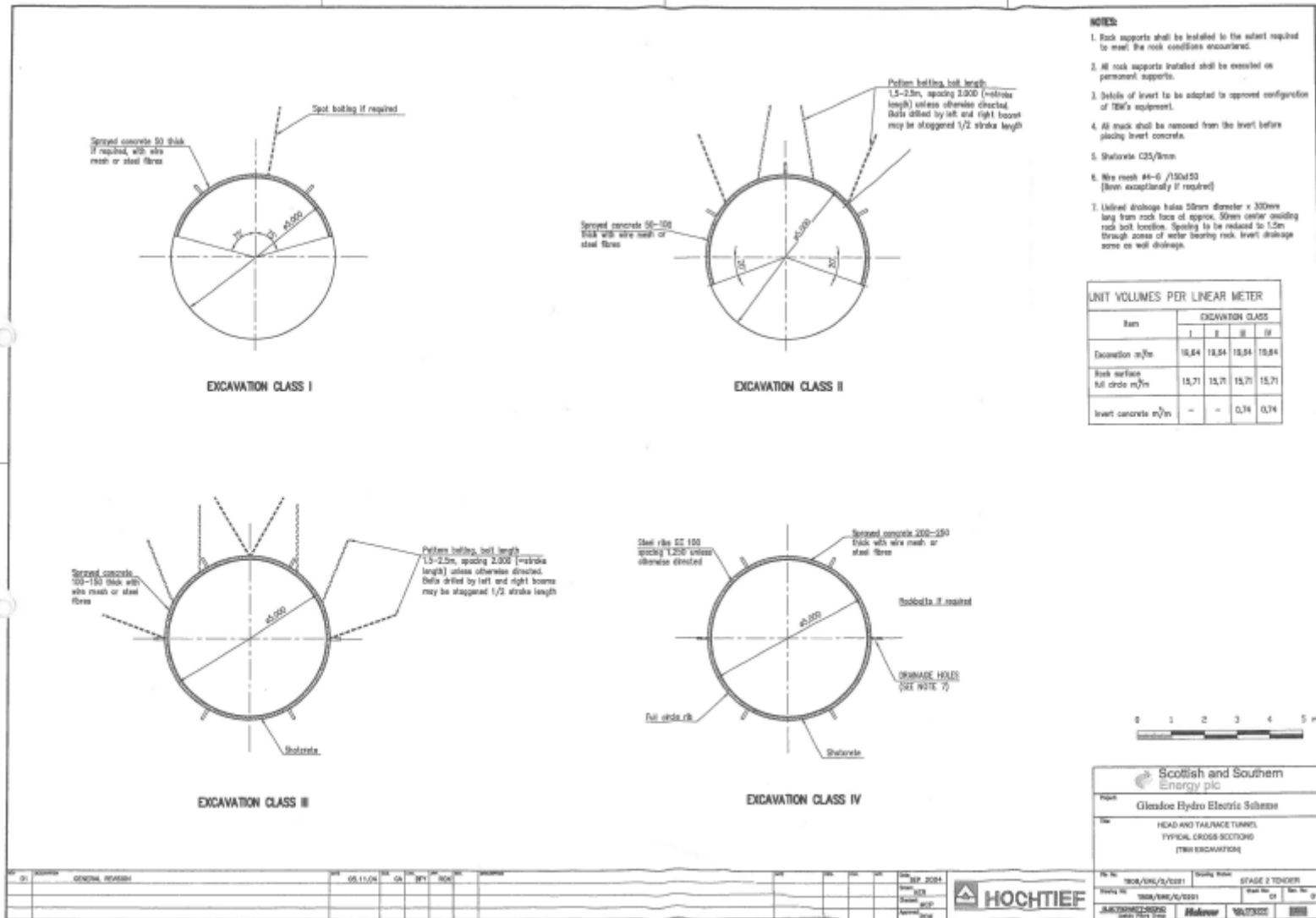
Operation of the scheme

[333] The absence of operational notes dealing with the needle valve opening parameters did not amount to a fault (or negligence) on the part of the pursuers. The obligation to explain how to operate the scheme rested on the defenders but, apparently, none of the 52 files provided by the defenders referred to needle valve openings.

[334] The failure to act upon the needle opening readings cannot be classified as a fault either. The experts on site, namely Andritz, had not reported any problem requiring urgent action. The commercial judge, having heard the evidence of this matter from experts on both sides, had preferred the testimony of the pursuers' experts that it was understandable that no action would be taken on the unusual readings given that testing was ongoing and the scheme returned to full output after the unusual readings occurred. It cannot be said that he was plainly wrong.

Conclusion

[335] In the result, the court ought to refuse the reclaiming motion and the cross appeal and adhere to the commercial judge's interlocutor of 2 February 2017.





Hazard ranking TBM headrace tunnel / hazards during impounding and operation					risk before mitigation measures					countermeasures	risk after mitigation measures			
hazard	schistose rockmass blocky	schistose rockmass very blocky	fault influenced area	comment	expected likelihood	comment	consequence	risk rating	Risk	planned counter measures	expected likelihood	consequence	risk rating	Risk
detachment of wedges during impoundment or operation	risk is judged as generally low in faulted and shotcreted parts; locally detachments possible, risk increased/high in unsupported parts	increased risk			2.5	unsupported	3	7.5	high	slow rate of impoundment, regular pattern of drainholes in shotcreted areas	1	3	3	low
extensive cracking of shotcrete during impoundment	some cracking is judged as admissible	increased risk	significantly increased risk in case of low rockmass moduli		2.5	very blocky rock mass	3	7.5	high	slow rate of impoundment, regular pattern of drainholes in shotcreted areas; in sections with low modulus consolidation grouting	1	3	3	low
water loss / outflow	risk is judged as generally low in low permeable rockmass (as expected) and where water table is higher than internal pressure; conditions would change in case of local increased / high permeable zones		significantly increased risk in case of increased permeability	increased degree of uncertainty	2.5	fault influenced area	3.5	8.75	high	massive water losses due to hydraulic jacking is generally not expected in unlined sections as stated in tender documents (Norwegian and minimum stress criterion), water losses in case of permeable zones – possibly enhanced by erosion (piping) processes – are counter acted by grouting all zones with increased inflow during excavation should be grouted	1	3	3	low
damage to concrete liner during impoundment, operation or pressure changes caused e.g. oscillating temporary high internal hydraulic pressures	not part of present report													
damage to steel liner	not part of present report													
damage to shotcrete in case of tunnel revision due to high water pressure in fissures	commented in countermeasures				3	shotcreted sections	3	9	high	drainholes in regular pattern are provided to avoid water pressure build up; further rapid emptying of pressure tunnel is avoided	1	3	3	low
scouring of shotcrete during operation	commented in countermeasures									in case of good adhesive (bond) strength between shotcrete and rock surface risk is generally judged as low; in case of	1	3	3	low
scouring of liner during operation	not part of present report													
erosion of erodible rock during operation	commented in countermeasures				3		3	9	high	application of shotcrete if not already covered / "protected" by steel rib support	1	3	3	low
 <p>low risk with likelihood * consequence 1-5 high risk with likelihood * consequence 6-9 very high risk with likelihood * consequence 10 - 15</p>														

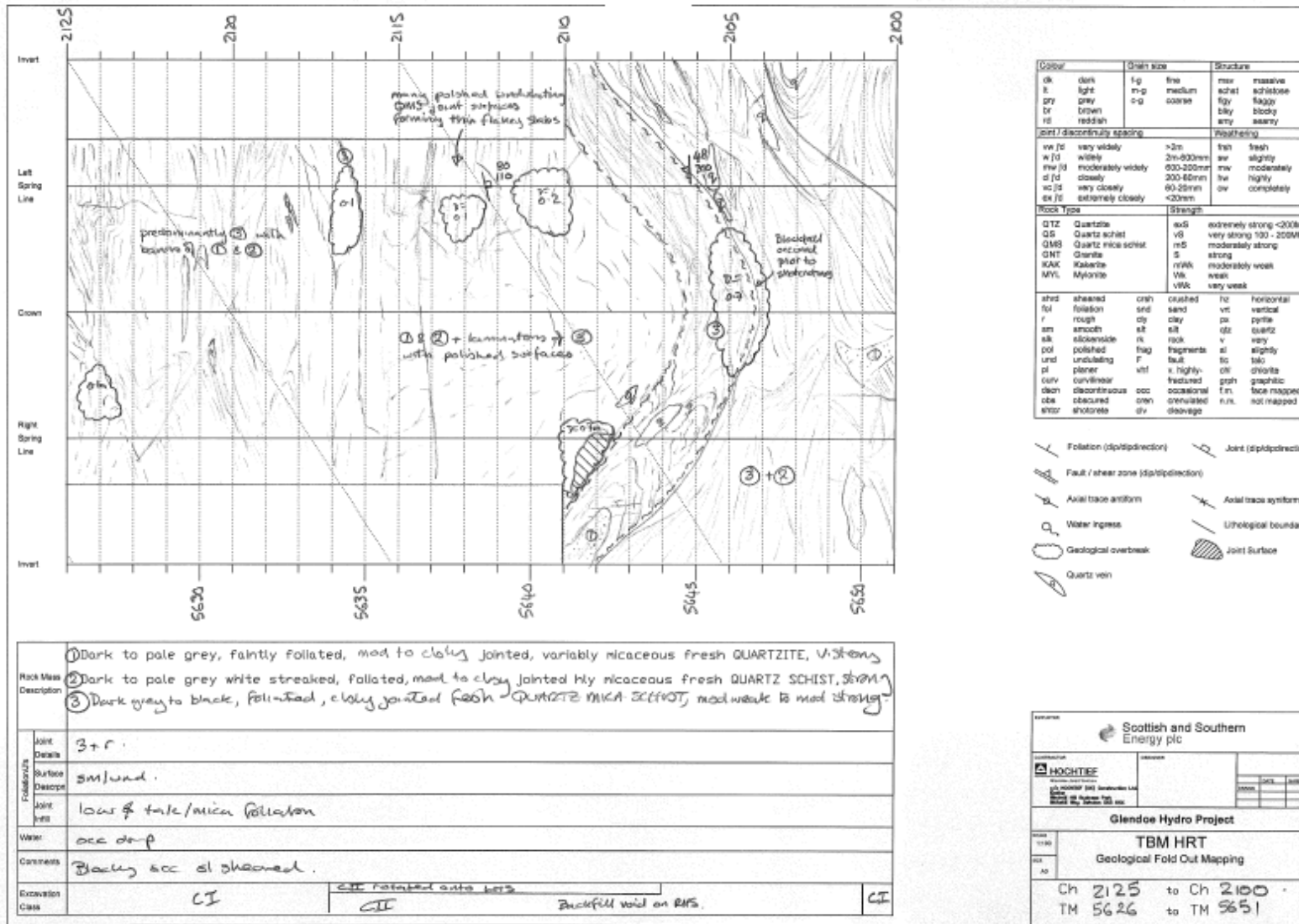
Table 11 Geotechnical risk assessment after excavation


		1314TRT TBM				Glendoe Hydro Scheme Rock Excavation Classification				
		Chainage Start		Chainage End		Class				
		Class I	Class II	Class III	Class IV	I	II	III	IV	
Rock mass / discontinuity description										
Hazards	General Description	None or local small wedges/slabs <0.2m ³	Block fall due to wedges/slabs spalling/ deformation due to: small scale folding, unfavourable joint orientation, presence of secondary foliation. High potential for systematic rock wedges affecting the upper half of the excavation	Unstable roof & side walls / raveling under atmospheric conditions	Unstable roof & side walls / raveling under atmospheric conditions					
	Typical Occurrence	No faults / shear zones or unfavourable discontinuities	Moderately sheared zones (unfavourably orientated parallel jointing). Zones with Microfolding and secondary foliation	Fault / sheared / hydrothermally altered zones. Very unfavourable discontinuities	Rock cover <5m Fault zones with weak materials, strongly sheared zone. Very unfavourable discontinuities.					
Typical Phenomena	Wedge Potential	roof side wall local small	individual <1m height local small	individual <2m avg height local <2m avg wide	multiple <2m avg height multiple <2m avg width	multiple >2m avg height multiple large blocks				
	Unravelling	above cutter head	occasional / localised where fractured	shallow where fractured	steady & progressive detachment	steady & progressive detachment leading to significant overbreak				
	Squeezing	above cutter head	negligible or very small deformations	moderate deformation	obvious squeezing					
Typical Properties	General Description	Good	Fair to Poor	Poor	Poor to very poor					
	Rock Mass	Sound. No clay coating joints	Blocky / moderately sheared. Closely spaced joints	Sheared Zones Hydrothermally altered e.g. sheared mica schist & quartz mica schist with high mica content, systematic clay coating - closely spaced	Faulted Zones Hydrothermally altered Weak rock mass					
	Shear / Fault Zones	None	Single Non-erodible <10cm	Multiple <0.5m	Multiple >0.5m					
	Erosion potential	None	non erodible	erodible talcrite / weak erodible rock	loose erodible fault gouge / talcrite					
Water	General Description	does not affect stability	(does not affect stability)	high water ingress	(high water ingress)					
Comments / Notes:					Overall Excavation Class:					
Support Category:		Class I	Class II	Class III	Class IV	Overall Support Category				
Nominal Rock Support	Description	No Support, or local bolting and/or local shotcrete in the rock	Systematic support upper 120'	Systematic support over full perimeter	Systematic support over full perimeter					
	Shotcrete	90mm if required	upper 120' 50-80mm wire mesh	100mm + wire mesh. Full arching	200mm + wire mesh. Full arching					
	Bolts	spot, 23mm ø, L=2.2m	1.4m (radial) x 1.6m, 23mm ø, L=2.2m, staggered 4-3-4 etc	1.1m radial x 0.9m, 23mm ø, L=2.2m, staggered 8-7-8 etc	23mm ø, L=2.2m if required					
	Ribs (if required)	none	none	none	Ribs 1-1.25m					
Optional Additional Support Measures and recommended actions (see DWG 192 DC.11.50.21.01) and Table 6 of 196 DC.11.50.97.02	Option	A	A B F	A B D E F L	B C D F G H I J N L					
		Option description								
	A	Increase application of shotcrete, extension of application of shotcrete.								
	B	Bolts below springline (by separate drilling equipment)								
	C	Additional bolts								
	D	Increase capacity and length of bolts (e.g. 32mm ø)								
	E	Bolted U shaped profiles for upper 120'								
	F	Hydraulic activation of cutterhead shield support.								
	G	Forward probing								
	H	Pressure relief drillholes								
	I	Forward consolidation grouting.								
	J	Stronger steel arches								
	N	Spine								
L	Monitoring									
		Name	Sign	Date						
Approved (for SSE)					Anticipated conditions for next round:					
Confirmed (for EWE)					Probing required for next round:					
Prepared (for HT)										



Glendoe Hydro Scheme
HRT TBM
Rock Excavation Classification

		HRT TBM				Rock Excavation Classification				
		Chisage Start		Ch. 2117 TM: 5634		Chisage End		Ch. 2101 TM: 5650		
		Class I		Class II		Class III		Class IV		
		Class I		Class II		Class III		Class IV		
Hazards	General Description	None or local small wedges/slabs <0.2m ³	Block fall due to wedges/slab spalling/detachment due to small scale folding, unfavourable joint orientation, presence of secondary foliation. High potential for systematic rock wedges affecting the upper half of the excavation	Unstable roof & side walls / raveling under atmospheric conditions	Unstable roof & side walls / raveling under atmospheric conditions					
	Physical Occurrence	No faults / shear zones or other major discontinuities	Moderately sheared zones (preferably oriented vertically (striking). Zones with blocky and secondary foliation	Fault / sheared / hydrothermally altered zones. Very unfavourable discontinuities	Rock cover <0m Fault zones with weak karsts, strongly sheared zones. Very unfavourable discontinuities.					
Typical Phenomena	Wedge Potential	Individual <1m height local small	Individual <2m avg height local <2m avg width	Multiple <2m avg height multiple <2m avg width	Multiple >2m avg height multiple large blocks					
	Unravelling	above cutter head	occasional localized where fractured	shallow where fractured	ready & progressive detachment					
	Spalling	above cutter head	negligible/very small deformations	moderate deformation	obvious spalling					
Rock mass description	General Description	Good	Fair to Poor	Poor	Poor to very poor					
	Rock Mass	Sound. No clay coating joints	Blocky / moderately sheared. Closely spaced joints	Sheared Zones Hydrothermally altered, e.g. sheared mica-schist & quartz mica schist with high mica content, systematic clay coating - closely spaced.	Failed Zones Hydrothermally altered Weak rock mass					
	Shear / Fault Zones	None	Single Non-parallel = 10cm	Multiple <0.2m	Multiple >0.2m					
	Erosion potential	None	none or slight	erodible kaolinite / weak erodible rock	low erodible fault gouge kaolinite					
Water	General Description	does not affect stability	(does not affect stability)	High water ingress	(high water ingress)					
Comments / Notes: Some shear zones with QMS kaolinite local slip formation & blockfall in sidewalls. Rotate CII support to LWS from CH2117-2107. Extend. Shorten to maximum extent in shotcrete bay & backfill voids.						Overall Excavation Class: CII				
Support Category:		Class I		Class II		Class III		Class IV		Overall Support Category
Nominal Rock Support	Description	No Support, or spot bolting and/or local shotcrete in the roof.	Systematic support upper 1.20m	Systematic support over full perimeter	Systematic support over full perimeter					
	Shotcrete	50mm if required	upper 100-50-60mm w/m mesh	100mm + wire mesh. Full periphery	200mm + wire mesh. Full periphery					
	Bolt (size if required)	none	14m (max) x 1.0m, 22mm s, L=2.2m staggered 4-0.4 etc.	1.1m incl s 0.50m, 22mm s, L=2.2m staggered 0.7-0 etc.	22mm s, L=2.2m if required					
Optional Additional Support Measures and recommended actions (see DWG 153.DG.11.00.21.01 and Table 8 of 155.DG.11.00.97.02)		Option A		Option B		Option C		Option D		
Option description		Increase application of shotcrete, extension of application of shotcrete.		Bols below springline (by separate drilling equipment)		Additional bolts		Increase spacing and length of bolts (e.g. 30mm s)		
Option description		Bored U shaped profile for upper 1.50m		Hydraulic installation of cable-anchored steel support		Grouted rockbolts		Pressure relief groutbolts		
Option description		Forward consolidation grouting		Strategic steel arches		Spiles		Mastbolts		
Name		Sign		Date		Anticipated conditions for next advance				
Approved for HRT		S. AGGR		18-9-07		Probing required for next advance				
Prepared for HRT		D. J. H. R.		23/8/7						





HRT TBM

Glendoe Hydro Scheme
Rock Excavation Classification

		Chainage Start		Chainage End						
		CH. 2084	TM. 5667	CH. 2082	TM. 5664					
		Class I	Class II	Class III	Class IV	Class				
		Rock mass/continuity description				I	II	III	IV	
Hazards	General Description	None or local small wedges/blebs <0.2m ³	Block fall due to wedges/blebs spalling/ deformation due to small scale folding; unfavourable joint orientation; presence of secondary foliation. High potential for systematic rock wedges affecting the upper half of the excavation	Unstable roof & side walls / swelling under atmospheric conditions	Unstable roof & side walls / swelling under atmospheric conditions				✓	
	Typical Occurrence	No faults / shear zones or unfavourable discontinuities	Moderately sheared zone (partially oriented parallel jointing). Zones with foliation and secondary foliation	Fault / sheared / preferentially oriented zones. Very unfavourable discontinuities	Rock cover <5m Fault zones with weak beds, strongly sheared zone. Very unfavourable discontinuities				✓	
Typical Phenomena	Work Potential	roof side wall	Individual <1m height local small	Individual <2m avg height local <2m avg wide	Multiple <2m avg height multiple <2m avg width	Multiple >2m avg height multiple large blocks			✓	
	Unravelling	above cutter head	occasional localized where fractured	shallow where fractured	steady & progressive detachment	steady & progressive detachment leading to significant overbreak			✓	
	Spalling	above cutter head	negligible or very small detriments	moderate deformation	obvious squaring				✓	
Typical Properties	General Description	Good	Fair to Poor	Poor	Poor to very poor				✓	
	Rock mass	Sound, no clay coating joints	Hardy / moderately sheared. Closely spaced joints	Sheared Zones hydrothermally altered, e.g. sheared mica schist & quartz mica schist with high mica content, systematic clay coating - closely spaced.	Fractured Zones hydrothermally altered Weak rock mass				✓	
	Shear / Fault Zones	None	Single fine-scale <10cm	Multiple <0.2m	Multiple >0.5m				✓	
	Erosion potential	None	non erodible	erodible kaolinite / weak, erodible rock	loose erodible fast gouge kaolinite				✓	
	Water	General Description	does not affect stability	(does not affect stability)	high water ingress	(high water ingress)				✓
Comments / Notes: <i>Moderately sheared zone</i>						Overall Excavation Class: CI				
Support Category:		Class I	Class II	Class III	Class IV	Overall Support Category				
Nominal Rock Support	Description	No cutting, pre-drilling and/or local excavation in the roof	Systematic support over 120°	Systematic support over full perimeter	Systematic support over full perimeter					
	Shotcrete	20mm if required	upper 120° 50-100mm wire mesh	100mm + wire mesh, full perimeter	200mm + wire mesh, full perimeter	Overall Support Category: CI				
Optional Additional Support Measures and recommended actions (see DWG 182.DC.11.88.21.01) and Table 6 of 184.DC.11.88.67.02	Bolt	20mm ø, L=2.0m	1.4m spacing @ 1.0m, 22mm ø, L=2.0m staggered 6/3-4 etc.	1.7m radial @ 0.5m, 22mm ø, L=2.0m staggered 8/7-8 etc.	22mm ø, L=2.0m if required					
	Ribs (if required)	none	none	none	Ribs 1-1.25m					
	Option	Option descriptions								
	A	Increase application of shotcrete, extension of application of shotcrete.								
	B	Bolt below working face by separate drilling equipment								
	C	Additional bolts								
	D	Increase capacity and length of bolts (e.g. 32mm ø)								
	E	Backed to sheared profiles for upper 120°								
	F	Hydraulic activation of cutback shield support.								
	G	Forward grouting								
H	Pressure relief drillholes									
I	Forward consolidation grouting									
J	Stronger steel arches									
K	Spiles									
L	Monitoring									
Approved (for SDR)	Name	Date								
Confirmed (for HSE)	Name	Date								
Prepared (for HRT)	Name	Date								
		Anticipated conditions for next advance		—						
		Probing required for next advance		—						



FIRST DIVISION, INNER HOUSE, COURT OF SESSION

[2018] CSIH 26
CA162/12

Lord President
Lord Menzies
Lord Glennie

OPINION OF LORD MENZIES

in the reclaiming motion of

SSE GENERATION LTD

Pursuers and Reclaimers

against

HOCHTIEF SOLUTIONS AG AND ANOTHER

Defenders and Respondents

**Pursuers and Reclaimers: Moynihan QC, Barne QC; CMS Cameron McKenna Nabarro
Olswang LLP**

Defenders and Respondents: McBrearty QC, Richardson QC; Clyde & Co.

10 April 2018

[336] I have had the considerable advantage of having read in draft the opinions of both your Lordship in the chair and Lord Glennie. This should enable me to address the difficult issues in this case with much greater brevity than would otherwise have been the case. I am particularly grateful to your Lordship in the chair for your clear and accurate summary of the contractual terms, the factual background, the evidence before the commercial judge and the submissions before this court, which I adopt in its entirety.

[337] The power station and associated tunnels, and the headrace (HRT) and tailrace (TRT) tunnels, were taken over by the employer on 18 December 2008. The defects date was stated to be 104 weeks after completion date. By 12 April 2009 a catastrophic collapse had occurred in a substantial section of the HRT, which resulted in the closure of the power station for a protracted period, and significant and costly remedial works. The power station did not begin to generate electricity again until August 2012.

[338] The collapse therefore occurred about four months after take over, and well before the expiry of the defects period. In order to answer the question “Where does the risk for the collapse lie?”, it is necessary to look in the first place to the terms of clause 80.1, which specifies the Employer’s risks. The fourth main bullet point of this clause includes among Employer’s risks:

“Loss of or damage to the parts of the works taken over by the Employer, except loss or damage occurring before the issue of the Defects Certificate which is due to

- a Defect which existed at take over.”

It follows that the collapse of a part of the HRT after take over by the Employer would be an Employer’s risk unless it was due to a Defect which existed at take over.

[339] Clause 11.2(15) provides, as follows:

“A Defect is

- a part of the works which is not in accordance with the Works Information or
- a part of the works designed by the Contractor which is not in accordance with
 - the applicable law or
 - the Contractor’s design which has been accepted by the Project Manager.”

The pursuers argue that the collapse of part of the HRT was due to a Defect which existed at take over, under two limbs – (1) that this was a part of the works which was not in accordance with the Works Information, and (2) that it was a part of the works designed by

the Contractor which was not in accordance with the Contractor's design which had been accepted by the Project Manager.

Limb one – not in accordance with the Works Information

[340] The HRT was a principal component of the civil works. The Works Information provided (at para 6.3.2), under the heading "Design Life", that it should provide reliable service without requirement for major refurbishment or significant capital expenditure for 75 years. It collapsed after four months. The commercial judge found (at para [147]) that the short answer to the question "Why did the tunnel collapse?" was that there was not enough support: poor rock conditions coincided with insufficient shotcrete and rock bolts. The commercial judge gave further detail at para [152]. The simple argument for the pursuers was that this amounted to a Defect because it was a part of the works which was not in accordance with the Works Information. There was no suggestion, either in evidence before the commercial judge or in submissions to this court, that there was any intervening event after take over which might have caused or contributed to the collapse. The Defect, namely the non-conformity with the Works Information, must have existed at take over. The collapse in the HRT is therefore excluded from the Employer's risks in terms of clause 80.1, and becomes a Contractor's risk in terms of clause 81.1.

[341] I am persuaded that the pursuers' analysis in this respect is correct, and that the collapse of part of the HRT is indeed a Contractor's risk. I have been hesitant to reach this conclusion, partly because of the time spent in evidence and submissions before the commercial judge, and in arguments before this court, on other issues and alternative arguments. Can the point be as simple as this? I am mindful of Lord Glennie's observation that the question has to be asked, and must be answered, not in the real world but in the

world of contractual interpretation; and I am equally mindful of all the recent guidance as to the correct approach to the interpretation of commercial contracts – eg *Arnold v Britton* [2015] AC 1619, *SIPP Pension Trustees v Insight Travel Services* 2016 SC 243, *Hoe International v Andersen* 2017 SC 313, *Rainy Sky v Kookmin Bank* [2011] 1 WLR 2900, and *Wood v Capita Insurance Services* [2017] AC 1173, to name a few. However, I am not persuaded that the real world and the world of contractual interpretation are always necessarily to be treated as parallel universes. Where a contract provides that the principal components of a scheme will provide reliable service without requirement for major refurbishment or significant capital expenditure for 75 years, and one of those components suffers a catastrophic collapse within about four months of take over 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.

[342] I do not suggest that para 6.3.2 provided a warranty that the HRT would in fact last for 75 years without major refurbishment or significant capital expenditure. The Employer had the benefit of the 104 week defects period from take over to determine whether the HRT did have a design life of 75 years. That, it seems to me, is consistent with the approach taken by the UK Supreme Court in *MT Højgaard v E.ON Climate & Renewables UK Robin Rigg East* [2017] UKSC 59. The assessment of whether the component had the requisite design life fell to be made at the defects date, and did not require to be made before then. By that date, it was abundantly clear that the HRT did not have a design life of 75 years, as it had already suffered a catastrophic collapse.

[343] It is, I think, important that the assessment falls to be made at the defects date, and not before. Your Lordship in the chair appears to rely (at paras [255] to [257]) on the general consensus of the experts that, at the stage of design (or perhaps on the basis of what they

saw before take over, or on the basis of the ground conditions understood to exist at the time of the design) that the design ought to have lasted for 75 years. That involves the exercise of foresight and judgment in assessing what may occur in the future. In the present case, no foresight is required; at the defects date one has the benefit of hindsight. The HRT had clearly collapsed.

[344] Lord Glennie has given a fuller analysis of this limb of the pursuers' argument; I find myself in complete agreement with his analysis and conclusion on it. I agree that the loss or damage to the works by virtue of the collapse of a portion of the HRT was at the Contractor's risk.

Limb two – not in accordance with the Contractor's design which has been accepted by the Project Manager

[345] It must be kept firmly in mind that in order to constitute a Defect under this limb there must be a disconformity between the part of the works being considered and the Contractor's design which has been accepted by the Project Manager (emphasis added). I am in complete agreement with your Lordship in the chair (at para [258] above) that the Contractor's design which was accepted by the Project Manager was the HRT RSM, which included Table 11, and that what occurred in the HRT as the TBM progressed, with the preparation of the REC sheets and mapping, was an exercise in the implementation of that design. The distinction between "approval" by Mr Sandilands and "acceptance" for the purpose of clause 21.2 is important.

[346] One of the hazards identified in Table 11 for the HRT was "erosion of erodible rock during operation". 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 countermeasures specified to deal with the hazard were “application of shotcrete if not already covered/‘protected’ by steel rib support”. The risk after the specified countermeasures had been implemented was reduced to 3, and was assessed as being low. This was the relevant part of the Contractor’s design which was approved by the Project Manager. It obliged the Contractor to apply shotcrete to erodible rock if this was not already covered or protected by steel rib support. The Contractor did not fulfil this obligation. The commercial judge found that the HRT collapsed because there was not enough support: poor rock conditions coincided with insufficient shotcrete and rock bolts (paras [147] and [152]). As your Lordship in the chair observes (at para [259]) it may be assumed from the commercial judge’s findings that some erodible rock had not been shotcreted.

[347] The question of whether the presence of the erodible rock ought to have been detected by those operating the TBM, or by the geologists on site at the time of excavation, is not in my view relevant at this stage. It may be relevant to the issue of Option M and whether this affects the Contractor’s liability (on which see below), but it is not relevant to the issue of whether a “limb two defect” existed. The Contractor’s design which had been accepted by the Project Manager obliged the Contractor to apply shotcrete to erodible rock if this was not already covered or protected by steel rib support, and it is clear from the risk ratings in Table 11 that this was an important element of that design. It was not fulfilled. The HRT as implemented was therefore a part of the works designed by the Contractor which was not in accordance with the Contractor’s design which had been accepted by the Project Manager. I agree with Lord Glennie that the pursuers have made out their limb two argument, and that on this basis too the loss or damage to the works by virtue of the collapse of a portion of the HRT was at the Contractor’s risk. I adopt Lord Glennie’s

reasoning in relation to limb two, and in particular his treatment of points (a) – (e) in paragraph [166] of the commercial judge’s Opinion, set out at paragraphs [382] to [388] of Lord Glennie’s Opinion.

Option M

[348] If Option M applies, it provides a limitation on the Contractor’s liability 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.

[349] As discussed above, the cause of the collapse was found by the commercial judge to have been insufficient shotcrete and rock bolts being provided where there were poor rock conditions. This was part of the implementation of the design, not part of the design itself. To this extent, I agree with your Lordship in the chair at paragraph [258]. However, your Lordship goes on to express the view (at para [271]) that what Mr Taylor designated by way of HRT support is properly classified as part of the Contractor’s design when considering Option M. I do not agree with this. Option M is concerned with Defects – that is, Defects as defined in clause 11.2(15). As discussed with regard to limb two above, it is important to keep in mind that in order to constitute a Defect there must be a disconformity between the part of the works being considered and the Contractor’s design which has been accepted by the Project Manager. What Mr Taylor designated by way of HRT support was never accepted by the Project Manager for the purpose of clause 21.2. Although Mr Sandilands may have indicated his informal approval, this could not amount to formal acceptance for this purpose. Anything arising from Mr Taylor’s designation by way of HRT support was part of the implementation of the design, but it was not part of the design accepted by the Project Manager. It was therefore not a Defect in the works due to the Contractor’s design

covered by Option M, and the limitation of liability provided by Option M does not apply to it.

[350] The finding by the commercial judge that there was insufficient shotcrete and rock bolts provided where there were poor rock conditions places the cause of the collapse as a failure of implementation. Whilst this might be categorised as a “defect” in ordinary parlance, it is not a Defect in the works due to the Contractor’s design, so Option M does not apply.

Burden of proof

[351] I agree with everything that your Lordship in the chair says at paragraphs [273] to [278] above. I have nothing to add, except to observe for completeness that the decision of the Second Division in *HBJ Claimants v Glasgow City Council* 2017 SLT 1135, in so far as relating to the burden of proof, depended on the particular circumstances of that case, in which no expert evidence was led by the employers and the tribunal reached a conclusion having complained that it did not have sufficient evidence to enable it to do so. In an unusual case such as that, the burden of proof may remain of importance, but it is not of significance in the present case. The fact that Mr Taylor did not give evidence was perhaps surprising, and was significant, but there was sufficient evidence from other sources to enable the facts to be determined in the absence of Mr Taylor’s evidence.

Reasonable skill and care

[352] On the view I have taken, it is not necessary to address the issue of reasonable skill and care. However, I find myself in complete agreement with the views expressed by your Lordship in the chair at paragraphs [279] to [295]. I agree that it is not possible to conclude

that the commercial judge erred in finding that the defenders did exercise reasonable skill and care. However, for the reasons given above, I do not consider that this has any relevance in determining the issues before this court.

Adequacy of reasons, and reliance on documents not spoken to

[353] I am in complete agreement with your Lordship in the chair in respect of each of these chapters (paras [296] – [307]).

Causation

[354] I regret that I disagree with the views expressed by your Lordship in the chair regarding causation at paragraph [308]. The commercial judge dealt with causation shortly, at paragraph [195] of his Opinion. His reasoning has some relevance to a claim based on a failure to exercise reasonable skill and care, but I do not consider that it is applicable to a situation where the collapse was due to a Defect which existed at take over, either under limb one or limb two. I agree with Lord Glennie (at para [376]) that no causation point arises in respect of a limb one defect, or, if it does, it is readily answered in favour of the pursuers. With regard to limb two, I agree with Lord Glennie's reasoning at paragraph [390]. The cause of the collapse was the coincidence of poor rock conditions with insufficient shotcrete and rock bolts. I consider that the pursuers' pleadings were sufficient to cover this, and I am not persuaded that their claim founders on the rock of causation.

Secondaries, clause 82.1 damages and expenses

[355] I am in complete agreement with everything that your Lordship in the chair says at

paragraphs [309] to [316], and there is nothing useful that I can add in relation to these topics.

Cross Appeal

Joint insurance

[356] Both your Lordship in the chair and Lord Glennie reject the defenders' cross appeal on this point. I agree. I am persuaded by Lord Glennie's careful reasoning on this point, and for the reasons which he gives I consider that the joint insurance point does not assist the defenders.

Breach of clause 82.1

[357] For the reasons which your Lordship in the Chair gives at paragraphs [321] to [323] I agree that there is no merit in the defenders' arguments in this regard.

Other matters

[358] I am in complete agreement with the views expressed by your Lordship in the chair in relation to the remaining issues, namely the counterclaim (paras [324] – [327]), repayment of the second adjudicator's award (para [328]), low availability damages (para [329]), quantum (and DAT) (at paras [330] – [332]), and the operation of the scheme (paras [333/4]). There is nothing that I wish to add in respect of any of these matters.

Conclusion

[359] For these reasons I consider that the reclaiming motion should be allowed and the cross appeal refused. I see no reason to depart from the approach to quantification taken by

the commercial judge in his Note dated 31 January 2017. I would consider that an award should be made in favour of the pursuers under four heads:

- (1) £107,617,830.94 in respect of costs of the recovery project, as set out by the commercial judge in para 6 – 8 of his Note;
- (2) £1,000,000 by way of low availability damages;
- (3) £32,357.98 in respect of part of the adjudicator's award; and
- (4) €388,720.27, also in respect of part of the adjudicator's award.

For the reasons explained by the commercial judge at para 10 of his Note, interest should be awarded at the rate of 4% *per annum* from the date of citation until the date of decree pronounced by this court in respect of head 1, and thereafter at the rate of 8% until payment; and at the rate of 4% from the date of citation until 2 February 2017 in respect of heads 2, 3 and 4, and thereafter at the rate of 8% until payment. I would reserve all questions of expenses, both before the commercial judge and before this court.



FIRST DIVISION, INNER HOUSE, COURT OF SESSION

[2018] CSIH 26
CA162/12

Lord President
Lord Menzies
Lord Glennie

OPINION OF LORD GLENNIE

in the reclaiming motion of

SSE GENERATION LTD

Pursuers and Reclaimers

against

HOCHTIEF SOLUTIONS AG AND ANOTHER

Defenders and Respondents

**Pursuers and Reclaimers: Moynihan QC, Barne QC; CMS Cameron McKenna Nabarro
Olswang LLP**

Defenders and Respondents: McBrearty QC, Richardson QC; Clyde & Co.

10 April 2018

Introduction

[360] I am grateful to your Lordship in the chair for having set out so comprehensively the facts, the evidence and the arguments pertaining to this Reclaiming Motion, as well as the relevant contract terms. I readily adopt those parts of your Lordship's Opinion.

[361] I find myself in agreement with your Lordship on most of the issues arising for decision by this court. In particular I agree with your Lordship's resolution of the issue

which was at the centre of the dispute between the parties, namely the impact of the decision to include Option M. In the course of the hearing before this court both parties presented their arguments on this issue on the premise that there was a potential conflict between, on the one hand, a strict liability regime contained within clauses 43 and 46.4 (absolute obligation to correct defects notified or discovered by certain dates) and clause 82.1 (absolute obligation to replace or repair loss or damage to the works occurring before the defects date); and, on the other, the proviso in Option M to the effect that the contractor was not liable for Defects in the works due to his design if he could prove that he used “reasonable skill and care” to ensure that his design complied with the Works Information. As your Lordship demonstrates, there is no such conflict. The obligation to correct defects (clauses 43 and 46.4) and the obligation to replace or repair loss or damage to the works (clause 82.1), and in each case the obligation, in default of so doing, to pay the employer the cost of him having done the work himself, is essentially a practical means of ensuring that when defects are identified or loss or damage occurs they are immediately rectified by the contractor and/or at his expense. The ultimate liability for such defects, loss and/or damage, however, is determined in accordance with the allocation of risk under clauses 80.1 and 81.1; and the effect of incorporating Option M is to convert the contractor’s liability for the occurrences which are at his risk from one of strict liability to one which is qualified by reference to a test of reasonable skill and care.

[362] However, I differ from your Lordship on the question whether the collapse of the tunnel was due to a Defect which existed at takeover. I consider that the collapse of the tunnel was indeed due to a Defect existing at takeover. Further, I consider that that Defect was not due to the contractor’s design of the works but rather to the implementation of that design. In those circumstances Option M is not engaged, and the defence of having used

reasonable skill and care to ensure that the design complied with the Works Information is not available to the contractor. It follows from this, in my opinion, that the collapse of the tunnel was a contractor's risk in terms of section 81.1 of the contract; and the defenders are liable to the pursuers for the costs of repairing the tunnel. On that basis I would allow the reclaiming motion.

[363] In what follows I shall explain why I have come to that view. In addition I propose to say a few words about the joint insurance point on which, though I agree on the outcome, I differ from your Lordship's reasoning.

The Defect Issue

[364] I start by putting the issue in some sort of context. The question whether the collapse of the tunnel was due to a Defect arises because of the terms of section 8 of the contract, "Risks and insurance". Clause 80.1 defines "Employer's risks" under a number of bullet points and sub-bullet points. The reference to a Defect in this connection is in the fourth main bullet point. Read short, with a focus on this particular part of the clause, clause 80.1 reads as follows:

"80.1 The Employer's risks are

...

- Loss of or damage to the parts of the works taken over by the Employer, except loss or damage occurring before the issue of the Defects Certificate which is due to
 - a Defect which existed at take over,
 - ..."

Clause 81.1 deals with contractor's risks and provides that from the start of the works until the Defects Certificate has been issued, risks which are not carried by the employer are carried by the contractor.

[365] The works, including the tunnel, were taken over by the pursuers in December 2008. The take over certificate was issued on 18 December. The tunnel began to collapse shortly thereafter, and finally collapsed within about six months of that date, that is to say some six months into the period of about two years between take over and the issue of the Defects Certificate. The collapse happened, and the loss or damage occurred, therefore, within the period covered by that provision. And since no work had been done on the tunnel since it was taken over by the pursuers, it must follow that whatever the problem was which caused the tunnel to collapse, that problem already existed at take over, even though it took a few months to become manifest and work itself out.

[366] But the question which has to be asked for the purposes of the fourth main bullet point under clause 80.1 is this: was the collapse due to a "Defect"? If not, that part of clause 80.1, which acts by way of an exception to employer's risk, is not engaged; and there would be no doubt that the collapse was an employer's risk event. At first blush, and in the real world, to ask whether the collapse was due to a defect might sound like a silly question. If a tunnel costing well over £100m and designed to last for 75 years or thereabouts collapses within the first six months after hand over, there was obviously something wrong with it; it was defective; there was a defect. How could there be any doubt about it? But the question has to be asked, and must be answered, not in the real world, but in the world of contractual interpretation; and, specifically, in the context of this contract, in which the term "Defect" is a defined term.

[367] The definition of Defect is to be found in Section 1, "General". Clause 11 sets out a list of "Identified and defined terms" and gives their meanings. Defined terms are given capital initials. "A Defect" is a defined term and its meaning is given in clause 11.2(15):

"(15) A Defect is

- a part of the works which is not in accordance with the Works Information or
- a part of the works designed by the Contractor which is not in accordance with
 - the applicable law or
 - the Contractor's design which has been accepted by the Project Manager."

The first bullet point under this definition ("a part of the works which is not in accordance with the Works Information") was, for convenience, referred to in argument as a limb one defect (or a first limb defect), while the second was referred to as a limb two (or second limb) defect. It is convenient to adopt this terminology.

A limb one defect: 75 year design life?

[368] The contract comprises a number of documents listed in paragraph (1) of the Form of Contract. In addition to the Form of Contract itself, and Schedule Part 1 (the "Contract Data", containing both the bespoke and incorporated numbered contract terms), those documents include Schedule Part 3 (Works Information) and Schedule Part 7 (Works Information for the Contractor's design). Schedule Part 3 (Works Information) is the "Works Information" referred to in the first main bullet point under clause 11.2(15). It may be that Schedule Part 7 is also part of that "Works Information", but nothing turns on this since I agree with your Lordship (in para [253]) that nothing in Schedule Part 7 qualifies the relevant part of the Works Information in Schedule Part 3. Schedule Part 3 (Works Information) is divided into a number of sections. Within Section 1 ("General"), part 2 contains a general description of the works. Para 2.1 includes, among the employer's objectives for the development of the scheme, "reliable service without the requirement for major refurbishment or significant capital expenditure within the design life of the scheme".

Part 6 deals with “Contractor’s Design” and covers matters such as design responsibility, design procedures and design development. Within para 6.3 (headed “Design Brief”), para 6.3.1 requires the contractor to design a hydro scheme with a minimum guaranteed performance according to certain Performance Criteria detailed within the Contract Data, while para 6.3.3 sets out the specifications to be followed in respect of plant, materials, equipment and practices. Of particular relevance here is para 6.3.2, headed “Design Life”, which provides as follows:

“6.3.2 DESIGN LIFE

The design life of the principal components associated with the scheme are detailed below. The components provide reliable service without requirement for major refurbishment or significant capital expenditure for a period of time as follows:

- Plant 40 years
- Civil Works 75 years”

It was not in dispute between the parties that the Head Race Tunnel (“HRT”) was one of the principal components associated with the hydro scheme.

[369] It is convenient at this point to consider the meaning and effect of such a provision.

One question is whether it is to be read as a 75 year warranty for the Civil Works. That question was discussed in *MT Højgaard v E. ON Climate & Renewables UK Robin Rigg East* [2017] UKSC 59 which concerned a contractual requirement that wind turbines had a design life of 20 years. As in the present case, there was a two-year period after hand over within which the turbines could be inspected and defects detected. Lord Neuberger, with whom the other Justices agreed, considered (at para 32) that it was unnecessary to decide whether that requirement amounted to a warranty that the foundations would have a lifetime of 20 years. His preferred interpretation was that the 20 year design life requirement “did not guarantee that the foundations would last 20 years without replacement, but that they had

been designed to last for 20 years without replacement” (see para 30). Such an interpretation meant that the contractor complied with his obligations if he handed over the works in such a condition; and the employer had the whole of the two year defects period within which to determine whether the Works did in fact have a 20 year design life. Mr Moynihan QC, for the pursuers, adopted that approach. He did not argue that para 6.3.2 imported a warranty or guarantee that the HRT would last 75 years without major refurbishment or significant capital expenditure. But he did argue, consistently with the approach in *MT Højgaard*, that para 6.3.2 was an assurance that the tunnel would be handed over with a design life of 75 years. That assurance was self-evidently not satisfied, since within the two year period after hand over the tunnel had completely collapsed.

[370] There is one further point to make in respect of para 6.3.2 of the Works Information in Schedule Part 3. There appears to be no universally recognised definition of “design life”, though a number of law and business dictionaries suggest that it refers to the period of time during which the relevant part of the works (in this case the tunnel) can be expected to function properly without major repairs. In the present case it is not necessary to search in the abstract for a definition of design life, since para 6.3.2 provides its own definition: (reading from the second sentence) the component (ie the tunnel) is to provide “reliable service without requirement for major refurbishment or significant capital expenditure for a period of time as [specified]”, ie for 75 years. This repeats the wording in para 2.1 (Employer’s Objective) quoted above. Although para 6.3.2 appears under the general heading Design Brief, the requirement for a design life of 75 years is not concerned only with elements of pure design; it cross refers to the broader requirement for reliable service during that period. What the employer is entitled to expect under this provision is that at hand over the tunnel will be designed and built to a standard where it can be expected that

it will provide reliable service for 75 years without requiring major refurbishment or significant capital expenditure. It is not enough that, according to the preponderance of expert evidence, the design was suitable for a tunnel expected to last without major expenditure for that period, or that the tunnel “ought to have lasted for the 75 year period, at least in the ground conditions then understood to exist and as set out in the relative report” (adopting your Lordship’s summary of the position in para [255]). Implementation of that design, having regard to the ground conditions actually encountered, is also directly relevant. If it is discovered during the two year defects period before issue of the Defects Certificate that the tunnel did not have a design life of 75 years, then that part of the works is not in accordance with the Works Information and there is a Defect within the definition of defect in clause 11.2(15).

[371] The pursuers’ argument is simple and attractive. The HRT, as built, did not have a design life of 75 years. It did not even last six months. It was therefore not in accordance with the Works Information of which paragraph 6.3.2 forms part. That is sufficient to constitute a limb one Defect. I find that argument compelling.

[372] The commercial judge made no specific finding on whether there was a Defect within the first limb of the definition in clause 11.2(15) of the contract. This was because he proceeded on the basis that Option M “placed an important brake on liability”. With respect to the commercial judge, this is to confuse two separate points. Option M only operates as a brake on liability for Defects in the works due to the contractor’s design. Proof that the contractor used reasonable skill and care does not mean that there is not a Defect; rather it establishes that although there is a Defect, it is not one for which the contractor is liable. So the question of whether or not there is a Defect has to be answered separately from the

subsequent question of whether it is one for which the contractor is excused liability because he can show that he used reasonable skill and care.

[373] Fortunately, however, in his conclusions on why the tunnel collapsed (at paragraphs [147]-[152]), the judge makes findings of fact which clearly establish, at least on balance of probabilities, the cause of the collapse. At paragraph [147], the judge finds that the tunnel collapsed “because there was not enough support: poor rock conditions coincided with insufficient shotcrete and rockbolts”. At paragraph [152] the judge describes the most likely mechanism of the collapse: weak rock deteriorated and lost its strength when submerged; the flowing water washed out areas of erodible rock; the erosion progressed and opened up larger seams; and, ultimately, the tunnel lost stability and collapsed. If, therefore, it is necessary to make detailed findings as to what it was which caused the tunnel to collapse, the judge’s explanation of the collapse as set out in those paragraphs provides all the material needed to justify the conclusion that the problem was insufficient support (shotcrete and/or rockbolts) in way of areas of poor rock conditions. (Those poor rock conditions, or weak rock, are often described as “erodible rock”, a term which, as your Lordship points out (at para [290]), did not require a definition but was generally understood as a reference to a type of rock which was particularly susceptible to erosion on contact with water.) But in truth, for the purposes of establishing a limb one Defect under reference to the required 75 year Design Life (paragraph 6.3.2), in circumstances where the tunnel collapsed within six months of hand over and without there having been some intervening the event (after hand over) capable of damaging the integrity of the tunnel, it is not necessary to do more than point to the fact of the collapse within that time and without any other credible explanation.

[374] For those reasons, expressed perhaps at undue length, I have come to the conclusion that the pursuers have made good their case that the cause of the collapse was a Defect which existed at take over, in that a part of the Works, *viz* the HRT, was not in accordance with the Works Information, *viz* the requirement for a tunnel with a design life of the 75 years. In those circumstances, and subject to Option M as discussed in the following paragraph, the loss or damage to the works by virtue of the collapse of the tunnel was at the contractor's risk.

[375] It still remains to be considered whether the defenders are relieved from liability by the terms of Option M, which provide 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. I can, however, deal with this point briefly. As your Lordship explains at paras [256]-[257], on the judge's findings there was no defect in the design as such. The evidence does not support the contention that the tunnel, as designed, should not have lasted the required 75 years. What appears to have gone wrong was in the implementation of that design, probably in the failure to identify (at the rock face in the tunnel) rock conditions requiring Class III and Class IV support, resulting, as the judge found, in insufficient support being provided to areas of erodible rock. It is unnecessary to ask whether that rock identification, or mis-identification, reflects a want of reasonable skill and care – the judge has found that it did not, and I agree with your Lordship that we cannot interfere with his findings of fact on this issue. But all that is irrelevant unless the Defect was a Defect in design. It was not. The Defect was not one of design but rather implementation of that design. It was that failure in implementation of the design which resulted in the fact that the tunnel on hand over did not have a design life of

75 years. Option M therefore does not come into play at all. It does not relieve the defenders from liability.

[376] I should briefly mention the question of causation. The judge dealt with it at para [195]. He proceeds on the basis that the pursuers' complaint was that the defenders had not installed at least Class III support in the areas of erodible rock. He finds, on the evidence, that only Class IV would have prevented the collapse. I come back to consider this (below) in connection with the limb two Defect, but this line of reasoning has no application to the limb one Defect, *viz* failure to provide the Works with a tunnel which met the requirement for a 75 year Design Life. Had it met that requirement, it obviously would not have collapsed within six months of hand over. No causation point arises in respect of this category of Defect; or, if it does, it is readily answered in favour of the pursuers.

A limb two defect: part of the works not in accordance with Contractor's accepted design?

[377] Your Lordship deals with this point at paras [258]-[262]. I entirely agree with your Lordship that the contractor's design "accepted" by the project manager was the HRT RSM, which included Table 11. What happened thereafter in the tunnel was, as your Lordship describes it, "an exercise in the implementation of that design". Accordingly, for present purposes, the question to be asked is whether part of the works (these being works which were designed by the contractor) were not in accordance with the contractor's design as set out in the HRT RSM, including Table 11.

[378] A copy of Table 11 is helpfully attached as Appendix 3 to your Lordship's Opinion. It is not, therefore, necessary to set out its terms in any great detail here. The structure of the Table is to identify hazards likely to be encountered in the HRT; to assess the severity of the risk associated with such hazards before mitigation measures are taken; to identify

appropriate “countermeasures”; and to re-assess the risk on the assumption that such countermeasures have been taken. One of the hazards identified, at the bottom of the Table, is “erosion of erodible rock during operation”. That risk was assessed with a risk rating score of 9, representing a risk at the top end of a band (coloured in yellow) described as “high risk”. The countermeasures identified to deal with that risk were: “application of shotcrete if not already covered/ ‘protected’ by steel rib support”. On the assumption that such countermeasures would be taken, the risk was reassessed as “low” (coloured in green).

[379] As your Lordship accepts (at para [259]), it may be assumed from the findings of the judge that some erodible rock had not been shotcreted. Whether this was because certain sections of rock were not identified as being erodible when in fact they were, or whether it was because a decision was taken on inspection in the tunnel that shotcreting was not necessary at that particular point, is of no consequence in my opinion. I should not be taken as concurring in your Lordship’s understanding (expressed in that same paragraph) that rock only became erodible after its initial deterioration. If that were the position, it would mean that no erodible rock as such was ever exposed in the tunnel during the course of construction, a proposition which I do not understand to be established either from the evidence or from the findings made by the judge. The encouragement (whether mandatory or otherwise) in Table 11 to protect erodible rock during construction by shotcreting or steel support would be meaningless if erodible rock did not yet exist, or, if it did, was neither visible nor detectable during the course of construction. It is safe, in my opinion, to proceed upon the assumption that erodible rock existed and was detectable in the area of the subsequent collapse and was, for whatever reason, not shotcreted or supported in any other way.

[380] On this basis, the question is whether the absence of shotcrete or other support in areas of erodible rock was in accordance with the HRT RSM, and more particularly Table 11, that being the relevant part of the contractor's design accepted by the project manager. That is a question of fact to which, in my opinion, there can be only one answer: No.

[381] In my opinion the question does not ultimately turn on whether there was a "mandatory requirement to shotcrete every area of erodible rock, however unimportant the area might have seemed to an experienced geological engineer on site" to use your Lordship's formulation in para [260]. That would be the correct test if the question was whether the defenders were in breach of contract by failing to shotcrete particular sections of erodible rock within the tunnel. But the question here is a subtly different one, relating not to breach but to the allocation of risk. All that has to be asked for this purpose is whether there was a Defect as defined in section 11.2(15); and that turns on the question of whether the works as carried out were or were not "in accordance with" the accepted design. If they were not in accordance with that accepted design, because of the absence of shotcreting or other support in way of erodible rock, then there was a Defect as defined in section 11.2(15) and the works were in that respect at the contractor's risk.

[382] At para [166] of his Opinion, the judge identified what he described as "formidable difficulties" with the pursuers' approach to this question. I shall deal with them in turn (only the first five are still relevant).

[383] The first point made by the judge was that this provision in Table 11 ran counter to the overwhelming weight of the other contractual provisions which call for the exercise of engineering judgement in the tunnel. That seems to me, with respect, to merge the design stage with that of implementation of the design. The design had been agreed and accepted: erodible rock was to be shotcreted if not otherwise protected. The implementation stage

required the exercise of engineering judgement in identifying which rock was erodible and required to be dealt with in this way. The fact that engineering judgement was to be applied at that implementation stage does not detract at all from the fact that the design itself, as agreed and accepted, specified what measures were to be taken to minimise the risk from the presence of erodible rock.

[384] I should add, since the point was pressed hard in argument by Mr McBrearty QC for the defenders, that I see little force in the argument that this was but one isolated provision in a technical document. It was in fact the provision which identified what steps were to be taken if erodible rock was encountered. But even if it were but one isolated provision, that would not mean that it would fall to be disregarded. It was part of the accepted design. A similar argument was raised and rejected in *MT Højgaard* at para 49.

[385] The judge's second point was that the term "erodible rock" was vague and required interpretation at the face. So be it. There would be a need at the face during the course of construction to identify erodible rock, but this was all part of the process of implementing the accepted design. Erodible rock, once identified during the course of this process, ought to have been shotcreted in accordance with Table 11.

[386] Thirdly, the judge thought that if the pursuers' argument was correct then determination of the "overall excavation class" on the REC sheet should have been a mechanistic process depending upon the worst feature ticked. This may be correct, but the REC sheets, both in their design and use, were devised as part of the implementation of the accepted design and were subservient to it.

[387] Fourth, the judge thought that if the argument was correct then the pursuers would have had to pay for a far greater level of support than that which was actually installed. That may be right, but so what? They had agreed and, through the project manager,

accepted the design which, in Table 11, required a specified level of protection to be given to erodible rock. That was something which would have to be paid for. Better to pay for the appropriate level of support than to risk a collapse within the tunnel.

[388] Fifthly, the judge commented that, if the pursuers were correct, it would not have been possible to have an unlined tunnel in similar geology – the classification would inevitably have resulted in a lined tunnel. That is not entirely correct. There might well have been a requirement for a section of the tunnel to be fully or substantially lined, but this would only apply to that part of the tunnel passing through the CFZ. There is no reason to suppose that other stretches of the tunnel, both upstream and downstream, would have had to be fully lined. They were not in fact fully lined and the issue about “Secondaries”, dealt with by your Lordship at paras [309]-[310], would seem to suggest that this was not in fact a problem.

[389] For these reasons I am persuaded that the pursuers have made out the case that there was a Defect under this head. The absence of shotcreting or other protection in areas of erodible rock meant that that part of the works was not in accordance with the contractor’s design accepted by the project manager. The Defect was not one of design; rather it was in implementing the design agreed between the parties and accepted by the project manager.

[390] This leads on, again, to the question of causation. The judge makes a finding, at para [195], that Class III support (ie full circumference shotcrete) would not have been enough to avoid the collapse; only Class IV support (increased shotcrete, together with steel arches) would have prevented it. On that basis he concludes that the pursuers have failed to establish that this Defect was causative of the collapse. There is, to my mind, a problem with this line of reasoning. It appears to proceed on the assumption that all that was required by the pursuers was Class III support. But this is not correct. In the first sentence

of that paragraph the judge identifies the pursuers' case as being that the defenders should have installed "at least class III support" (emphasis added). In an earlier paragraph (para [165]) the judge identifies the pursuers' case as being that the defenders "should have installed class III or IV support wherever it found erodible rock". Although the pleadings are opaque on this point, it appears that the judge did not understand the pursuers' case to be limited to the use of Class III. Nor did Table 11 confine itself in this way; it required shotcreting "if not already covered/ 'protected' by steel rib support" (ie Classes III and IV as appropriate). There is no reason to suppose that if the erodible rock had been treated in this way the collapse would not have been avoided. There is certainly no finding to this effect by the judge. In my opinion the causation point should be answered in favour of the pursuers.

Conclusion on Defects

[391] For the reasons set out above, I consider that the pursuers have established their case on Defects under both limbs. Neither being a Defect in design, Option M has no application. It follows that in terms of clause 80.1 and 81.1 the collapse was at the defenders' risk and they are liable for the cost of repairs.

The joint insurance issue

[392] At paras [317]-[320] your Lordship in the chair in effect adopts the reasoning of the judge on the joint insurance issue and rejects the defenders' cross appeal on this point.

Although I concur in rejecting the cross appeal on this point, I differ from Your Lordship as to the reasons for doing so; and, since the point is of some importance, I should explain my reasons.

[393] As your Lordship notes in para [317], the defenders were obliged in terms of clause 84 to provide insurance in the joint names of the parties in respect of (amongst other things) loss of or damage to the works caused by events which were at their risk prior to the issue of the defects certificate. The defects certificate is issued at the defects date (104 weeks after completion of the works) or at the end of the last defects correction period, whichever is later (clause 43). Accordingly, damage to the tunnel as a result of the collapse, which occurred within six months or so after completion, would fall within this category, provided, of course, that the cause of the collapse was at the defender's risk. The allocation of risk is dealt with in clauses 80.1 and 81.1. So far as material to the present issue, once the works had been taken over by the pursuers (which they had been), they were at the pursuers' risk unless, among other things, the loss or damage occurred before the issue of the defects certificate and was due to a defect existing at take over; in which case they were at the defenders' risk. In respect of loss of or damage to the works (ie the tunnel), the insurance cover was to be for the full replacement cost.

[394] Clause 85 required the insurance policy taken out by the defenders to include a waiver of the insurer's rights of subrogation against the insured's employees. Although this provision did not itself stipulate for the policy to contain a waiver of subrogation in claims against the insured themselves, the policy in fact taken out by the defenders, and presumably accepted by the Project Manager on behalf of the pursuers (clause 85.1), did in fact contain such a waiver of subrogation rights against the insured.

[395] In terms of clause 83.1, each party agreed to indemnify the other against claims, proceedings, compensation and costs due to an event which was at that party's risk.

[396] Since the insurance required to be taken out under clause 84 was only to cover loss and damage due to events which were at the defenders' risk, the defenders' argument has to

assume, contrary to their primary case, that the tunnel collapse was indeed due to an event which was at their risk. On that hypothesis, their argument is straightforward. Where parties have agreed to enter into a joint insurance in respect of risks of loss and damage to the works, in the event of such loss or damage they must look to the insurance policy for redress and cannot bring claims against one another in respect of that damage. They rely on a long line of English cases, culminating in the judgments in the House of Lords and the United Kingdom Supreme Court in *CRS* and the *Ocean Victory* respectively, to the effect that the existence of a joint insurance provision normally gives rise to an implied term to that effect.

[397] The matter was argued at debate on the basis of the parties' pleaded cases. It appears at that stage (though no such distinction was drawn in the argument before this court) to have been accepted on behalf of the defenders that the joint insurance argument did not respond to the claim brought by the pursuers under the Defects provisions in clauses 43 and 46.4, and (possibly) did not respond to the claim under clause 82.1: see paras [44]-[48] of the judge's Opinion of 14 July 2015 [2015] CSOH 92. But it was argued that the joint insurance did preclude a claim by the pursuers for an indemnity under clause 83.1. The judge rejected that argument. He held, in short, that an implied term of the sort contended for would render clause 83.1 redundant (paras [81]-[82]); he pointed to the absence from the contract of a requirement for a waiver of subrogation rights in respect of the parties themselves (para [83]); and he attached importance to the terms of clause 85.4 which provided that amounts not recovered from the insurer should be borne by the parties according to where the risk lay (para [84]). In summary, he held (para [87]) that an implied term of the sort contended for by the defenders was not necessary for the purposes of business efficacy and would do violence to the language selected by the parties; there was

no irrebuttable presumption that parties had no liability to one another simply because a joint names policy is in place and to hold otherwise would be “to merge the law of insurance with the law of contractual interpretation”.

[398] As the judge recognised at para [79], the thrust of the authorities is strongly in favour of joint names insurance displacing contractual liability. That is confirmed by the judgments of the Supreme Court in the *Ocean Victory*, which was decided after the judge reached his decision in this case. Although none of the relevant cases are Scottish, and the observations of the various judges on this point are all *obiter*, I agree with your Lordship in the chair that the reasoning on this point is compelling and of high authority and should be followed in Scotland.

[399] Although, as already observed, the judge noted that the thrust of the authorities is strongly in favour of joint names insurance displacing contractual liability, it is nonetheless worth pausing to note the reasons for this and the strength of that presumption. The *Ocean Victory* involved an appeal by hull insurers (as assignees of claims by owners and demise charterers) against a finding by the Court of Appeal that time charterers were not in breach of a safe port warranty in the charter party. That appeal was dismissed unanimously by the Supreme Court. However the members of the court also expressed views on the effect of a provision in the demise charter for joint insurance. On this point they were divided.

[400] Lord Toulson (with whom Lords Mance and Hodge agreed) categorised the question of whether the contractual scheme precluded a claim for the insured loss as one of construction (para 139). He continued:

“The question in each case is whether the parties are to be taken to have intended to create an insurance fund which would be the sole avenue for making good the relevant loss or damage, or whether the existence of the fund co-exists with an independent right of action for breach of a term of the contract which has caused that loss.”

He relied (at para 140) upon the decision in *CRS* for the proposition that:

“... it cannot have been the parties’ intention that parties who were jointly insured under a contractor’s all risks policy could make claims against one another in respect of damage covered by the insurance, or that the insurers could make a subrogated claim ... and that the court would if necessary hold that there was an implied term to such effect...”.

Lord Toulson approved the reasoning of Mr Recorder Jackson QC in *Hopewell Project*

Management v Ewbank Preece [1998] 1 Lloyd’s Rep 448 at 458, noting that such an implied

term presupposed that the party relying on it had not prevented recovery under the policy.

The insurance arrangements provided not only a fund but also a term for the avoidance of commercially unnecessary and undesirable disputes (para 144).

[401] Lord Mance made additional observations (at para 114) to the effect that the principle was best viewed as resting on the “natural interpretation of or implication from the contractual arrangements giving rise to such co-insurance”, citing Lord Bingham in *CRS* at para 7. He thought it “inconceivable” (para 119), that:

“... anyone contemplated that the co-insurance to be arranged could give rise to successive payments of the same sum to different parties, with the second of such payments going to reimburse insurers for the first”.

He concluded (at para 122) that the reason why there was no claim against the party in default was not that such a claim existed but was discharged by receipt of payment from the insurers, but rather that:

“... under a co-insurance scheme like the present, it is understood implicitly that there will be no such claim.”

[402] Lord Sumption, with whom Lord Clarke agreed on this point, took the same view on this general principle. He explained (at para 98) that in the case of joint insurance, or insurance taken out pursuant to a term of the contract for the benefit of one of the parties

thereto, the collateral benefits rule (often expressed in the maxim that insurance is *res inter alios acta* or, loosely translated, none of his business) had no application since the insurance “manifestly is the wrongdoer’s business”. He expressed the general principle in this way (at para 99):

“It is well established, and common ground between the present parties, that where it is agreed that the insurance shall inure to the benefit of both parties to the contract, they cannot claim against each other in respect of an insured loss. Co-insurance is the paradigm case. ... What is less clear is its juridical basis. ... The better view, which was endorsed by the House of Lords in [CRS], paras 61-65 (Lord Hope of Craighead), is that it is an implied term of the contract of insurance and/or of the underlying contract between the co-insureds pursuant to which their interests were insured. The implication is necessary because if the co-insureds are both insured against the relevant loss, the possibility of claims between them is financially irrelevant. It would be absurd for the insurer to bring a subrogated claim against a co-insured whom he would be liable to indemnify against having to meet it. ...”

Thus far there is no difference between what he says and the views of the majority.

[403] What is important for present purposes, and this is the reason for citing these passages, is to note the strength of the presumption. Words such as “inconceivable” and “absurd” suggest the need for powerful contra-indicators if such a term excluding contractual liability is not to be implied.

[404] I should mention at this point that Lord Sumption went on (in para 100) to raise a different question directed to identifying the basis for the rule. He said this:

“When we say that one co-insured cannot claim damages against another for an insured loss, is that because the liability to pay damages is excluded by the terms of the contract, or is it because as between the co-insureds the insurer’s payment makes good any loss and thereby satisfies any liability to pay damages?”

He went on to give an illustration of why that point might be significant. He concluded that the correct analysis would depend upon the particular terms of the particular contract and that the answer would not necessarily be the same in every case. In the course of argument in this case the court was told that there was here a significant shortfall between the amount

of the insurance proceeds payable under the policy and the actual cost of the repairs to the tunnel. This case may therefore provide an illustration of a situation in which the question raised by Lord Sumption might be critical. It may also illustrate the need to consider what other qualifications there might be to the general principle adumbrated in the decided cases: for example, what is the position if, through the fault or neglect of one or other party, the insurance is not taken out in the terms agreed in the contract; or if insurers are entitled to avoid liability; or if the agreed insurance proves inadequate to cover the amount of the loss? However, there are no pleadings on this matter, nor was any evidence led on it; and neither side sought to develop the argument in any detail. In those circumstances it would not be appropriate for this court to enter into a detailed discussion of this point and it is, in any event, unnecessary to do so since the joint insurance point can be disposed of on other grounds.

[405] For present purposes, what is important is the recognition that the general principle exists and is based upon the proper construction of the contractual arrangements between the parties or an implied term thereof; the difference is one of expression only and is immaterial. It should be noted that the principle does not depend, as was thought at one time, upon any consideration of circuitry of action; and, since it does not depend upon considerations of circuitry, it must in my view now be recognised that the question whether the contractual documents or the policy of insurance contains a waiver of rights of subrogation is irrelevant to its existence.

[406] The judge accepted the existence of the principle that joint names insurance generally displaced contractual liability but recognised, correctly, that whether it applied in the present case depended upon the terms of this particular contract. He considered that it did not apply for the reasons summarised above. I differ from the judge on this point.

[407] The first of the reasons given by the judge was that, so he thought, the implication of such a term ran counter to clause 83.1 and would effectively render clause 83.1 redundant. I find this difficult to understand, since clause 83.1 extends well beyond loss and damage of the types covered by the insurance clause (clause 84); provides for mutual indemnities whereas the insurance clause is concerned only with loss and damage occurring as a result of events at the defenders' risk; and is not time restricted to the same extent as the insurance clause.

[408] Secondly, the judge relied upon the absence in clause 85 of any waiver of subrogation rights as against the other party to the contract; but as he himself had made clear (in paras [20]-[21]), the policy itself, which was entered into as a matter of agreement between the parties, did contain such a waiver of subrogation rights. And further, as I have sought to explain, the existence or otherwise of a waiver of subrogation rights is irrelevant to the application of the principle now that it is recognised that it arises as an implied term of the contract rather than out of the need to avoid circuity of action.

[409] As to the judge's third point, namely that under clause 85.4 it is provided that the amounts not recovered from insurers shall be borne by the parties in accordance with the allocation of risk under the contract, there is scope for the application of that provision in respect of items such as deductibles; it is not a pointer against implication of the joint insurance term. It is possible too that that clause would be apt to cover a situation such as that contemplated by Lord Sumption in the passage referred to, where the insurance does not for whatever reason answer to the full amount of the claim, but this does not detract from the general presumption as to the existence of the implied term; and, in any event, there are no averments (and there has not been any evidence) as to amounts not recovered from the insurers on which clause 85.4 would bite.

[410] In my opinion, none of these three factors relied on by the judge, taken individually or together, point to an intention to exclude the implied term to the effect that joint names insurance excludes contractual liability.

[411] Accordingly, there is in my view force in the defenders' argument that had the claim been brought simply on the basis of a claim for damages for breach of contract leading to the collapse of the tunnel and/or on the basis of a claim for an indemnity pursuant to clause 83.1, it could have been met by the defenders by relying upon the implied term identified in the cases arising from the agreement between the parties to effect insurance in joint names.

[412] However, this does not assist the defenders in the present case. The claim advanced under clause 43.1 and 46.4 is in respect of the failure by the defenders to correct Defects and/or, in default of so doing, to pay the pursuers the costs of carrying out the work themselves. Similarly, the claim under clause 82.1 is in respect of a failure by the defenders to replace and repair loss and damage to the works. These are claims for failure to comply with specific provisions requiring the defenders to carry out repair or reinstatement works similar to those discussed by Lords Hope and Rodger on a hypothetical basis in *CRS* (at paras 49 and 71 respectively). The implied term arising from the provision for joint insurance would not prevent the pursuers succeeding in these claims for the simple reason that the joint insurance required to be taken out pursuant to clause 84 was insurance against loss or damage to the works and did not cover breach of contract by the defenders in failing to carry out specific obligations under the contract. Had the defenders in fact corrected the defects in accordance with clause 43.1 or, as the judge correctly found that they ought to have done, replaced and repaired the damage to the works in accordance with clause 82.1, or had they paid the pursuers the cost of carrying out such work in default of doing it themselves, they might have sought to recover their costs of so doing from the pursuers

pursuant to clause 83.1. But that would have been on the basis that, as they would have had to contend, the relevant risk lay with the pursuers – and that would not have been covered by the joint insurance which only answers to events at the defenders' risk.

[413] For these reasons I consider that the joint insurance point does not assist the defenders and, albeit for different reasons, I too would dismiss the cross-appeal on this point.

Disposal

[414] In my opinion the reclaiming motion should be allowed on what I have called the Defect Issue and the cross-appeal refused.

[415] So far as concerns the consequences of this, the judge dealt with the financial consequences in his Note of 31 January 2017. He indicated that if, contrary to his own view, the defenders were liable for the collapse of the tunnel because that collapse was a contractor's risk event, then he would have awarded the pursuers the sum of £107,617,830.94 in respect of the cost of the recovery project: see paras 6-8 of that Note. I see no reason to depart from this assessment. I would award interest on this sum on the same basis as the judge, namely at the rate of 4% *per annum* from the date of citation until the date of the decree pronounced by this court, and thereafter at the rate of 8% until payment. That sum is in addition to the £1,000,000 awarded by the judge as low availability damages and the sums of €388,720.27 and £32,357.98 paid by the pursuers under the second adjudicator's award which the judge held to be recoverable by them: see paras (1) and (2) of the interlocutor dated 2 February 2017. On those sums I would award interest at the rate of 4% per annum from the date of citation until 2 February, being the date of the decree pronounced by the judge, and thereafter at the rate of 8% until payment.

[416] I would reserve all questions of expenses. Although the appeal on the expenses point (as a discrete point) is to be refused, if the appeal on the Defect Issue succeeds then expenses both in this court and before the judge will be at large.