Mark Hamill

1. Please provide a copy of your up to date CV.

My name is Mark Hamill and I am 44 years old. My contact details are known to the Inquiry. I am currently the Vice-President of Risk Management at Abu Dhabi Airports Company. My role in the tram project was as Risk Manager for Transport Initiatives Edinburgh (TIE) from May 2007 to December 2010. I have supplied a copy of my CV to the Inquiry.

2. When did you start at TIE? How were you recruited? Were you recruited specifically as a risk manager? If not, what other job title(s) did you have before your appointment as risk manager? When recruited, was your role specifically in relation to the tram project or did it extend to the other projects being managed by TIE?

I started with TIE in May 2007. I had applied for a job with another consultancy group unrelated to TIE. The role had been filled, however, the person dealing with my application knew someone who worked at TIE and said that they were looking for someone with my qualifications. I then made contact with someone called Mark Bourke and thereafter met at an interview with Mr Bourke and Mr Geoff Gilbert. I was initially recruited as Risk Manager and later became Risk and Insurance Manager. I worked solely on the tram project.

3. Apart from you, which persons and organisations had responsibility for risk management? In particular, what role(s) were played by eternal consultants?

Prior to joining TIE, the risk management function was provided by a consultant from the consultancy firm Turner and Townsend. The

consultant was Nina Cuckow and she conducted a four week handover with me when I joined. Thereafter I was responsible for the risk management process on the tram project.

4. When and why did you leave TIE?

I left TIE in December 2010. I was living in Newton Mearns at the time and I was offered a job based in Glasgow City Centre and accepted that offer.

Risk Management – General

5. Can you explain the processes for risk assessment and management that were used by TIE? This should include what reports were prepared in relation to risk, by whom and how they were prepared, to whom they were sent and what was done with them or on the basis of them. Who were the key personnel? What were the key documents produced as part of the strategy to assess and manage risk? What was your role in relation to these processes and what tasks were undertaken by others?

The risk management process followed the ISO: 31,000 International Risk Management standards and also the guidelines for risk management provided within the Project Risk Analysis and Management (PRAM) guide by the Association of Project Management (APM). This process required the various teams within the project to identify and assess risks relevant to their respective areas. Facilitated by myself, the Risk Manager, these various teams were responsible for identifying risks and thereafter each team would offer support to and be responsible for the action plans designed to mitigate any risks identified. Each risk and action plan was assigned an owner from within the project team and project directors. The product of this process was a Project Risk Register (PRR).

The project used the risk management software Active Risk Manager (ARM). This is a recognised risk management tool, which acts as a

database for recording and reporting risk information. The system provided an auditable record of all risk management information relevant to the project. The folder structure of ARM was aligned with the Work Breakdown Structure of the project schedule. The project schedule was prepared using a scheduling software called Primavera. Each element of the project had its own risk register and these combined would form the PRR. My role was to facilitate and lead this process.

I am not privy to the board decision-making processes nor can I comment on the extent to which the risk management information played a part in any such process. The normal procedure before a Tram Project board (TPB) meeting was that I prepared a risk report for the meeting in consultation with Steven Bell. Steven Bell presented the report to the board. I was not involved in either presentation nor any decision-making.

Transport Scotland (TS) also received monthly project reports which contained risk information.

The City of Edinburgh Council (CEC) requested frequent (sometimes daily) updates, had access to the risk registers at all times and attended monthly project review meetings during which risks were discussed. The risk registers were also externally audited by the Office of Government Commerce (OGC).

6. What Risk Registers were there? How and by whom were the Risk Registers compiled? How was use made of the Risk Registers? As far as you are aware, what role did consideration of risk play in management and board decisions? When/where/by whom were the Registers scrutinised and/or discussed? In the TPB minutes for April 2007 (in the May papers – [**CEC01015822**]) it is noted that the risk register was taken as read. This seems inconsistent with is being scrutinised or being used to inform decisions. Do you agree? Do you consider that the risks facing the project at that time are adequately identified I the risk registers? What assessment was carried out to determine whether the mitigation strategies identified would in fact reduce the risk of its consequence? Once these strategies were implemented,

There were three risk registers; the Multi Utilities Diversion Framework Agreement (MUDFA) risk register, the Project Risk Register (PRR) and the Primary Register (PR). The data was entered mainly by me; however, project managers would also update their respective areas. The information entered was compiled following one to one discussions and group workshops. All relevant risk information was provided to the project directors; however, I do not know what role risk played in management and board decisions.

I did not join TIE until May 2007 and therefore cannot comment on a meeting in April 2007. Equally, I cannot comment on analysis of risks facing the project at that time.

7. Can you explain QRA and Monte Carlo Analysis, how they were carried out and what results they provided?

One definition of Quantitative Risk Analysis (QRA) is that it is the process of numerically analysing the effect of identified risks on project objectives.

The Monte Carlo Simulation (MCS) is a recognised industry technique used to understand the impact of risk on a project. The project conducted cost QRAs using the MCS.

When using MCS, uncertain inputs in a model are represented using a range of possible values, this is known as probability distributions. By using probability distributions, variables can provide different probabilities of different outcomes occurring. Probability distributions are a much more realistic way of describing uncertainty in variables of risk analysis. During an MCS values are sampled at random from the input probability distributions.

In the cost QRA exercise on the project the inputs were the percentage likelihood of each risk and a three point estimate of the financial impact of each risk. The three points were minimum, most likely and maximum. Each set of samples is called an iteration and the resulting outcome from

that sample is recorded. MCS does this thousands of times resulting in probability distributions of possible outcomes. The output of this exercise would be a probabilistic range of values which informs senior management decisions on what we called the Project Risk Allowance (PRA).

8. Did Transport Scotland or City of Edinburgh Council impose any requirements as to how risk was managed?

I do not recall there being any particular protocols setting out the requirements of either TS or CEC. A monthly report was provided to TS as per paragraph 5 above. Reports were also provided to CEC as per paragraph 5 above although I can also add that CEC regularly asked for a variety of information.

9. How did the approach to and management of risk in TIE compare with other organisations for which you have worked? Was the assessment and management of risk undertaken well at TIE?

The approach at TIE to risk management was no different to anything I have or had encountered on any other large projects. The assessment and management of risk processes within TIE followed industry standards (see Q5).

10. Are you aware of other ways in which risk might be assessed and/or managed at the time of the tram project? What are they and what is your experience of them? Can you comment on how appropriate/useful the TIE approach was?

I am not aware of any other approach. The approach taken at TIE was as per international standards (see Q5).

11. Have there been any developments in the procedures generally for assessment and management of risk since you left TIE? If so, can you provide an outline of

them and give your view as to whether they would have been of any assistance in the tram project?

I am unaware of any such developments in the industry which have materially altered the process of risk management which might be applied in such a similar project.

12. What was the ARM software (see [**TRS00004079**], page 30)? What did it do? It may assist to look at [**CEC01441488**] which has some screen shots. Had you used it before? Did it work well?

I have explained ARM in my answer to question 5. I have been referred to a document which is supposed to contain screenshots. The document referred to does not contain screenshots. I had used ARM before. It is one of the more competitive programmes on the market and as far as I am aware, it did what it was supposed to do at TIE.

13. What was your understanding as to how risk allowance would be 'used' once the contract was awarded? From time to time the TPB approved risk drawdown (for example, see **[CEC00843272]**, page 19). What option was there but to approve it? What would have happened had they refused the request?

A risk allowance is a sum agreed at the commencement of the project which is additional to the project estimate. The total of both would form the project budget. The risk allowance is calculated to allow for additional costs arising if identified risks have been realised. The risk allowance is designed to be used to meet costs when identifiable risks crystallise into real costs. I was not privy to Tram Project Board (TPB) deliberations regarding draw down requests although I did prepare the risk drawdown paperwork. I cannot comment on what, if any, other options were available to the TPB had they refused such a request.

14. The reports in the TPB papers routinely note that risks have been reviewed. What did this entail? Who did it and what records were kept of this? What was the purpose of the exercise? Was it to identify new mitigation measures or was it intended to quantify the risk presented to the project and make adjustments to the budget estimates? There is reference in the Report with the June papers to the purpose being to ensure that the QRA output was as accurate as reasonably possible ([**CEC01021587**], page 17). What did this involve?

The review of risks was part of the risk management process. This was done either with the project teams or with individual risk managers through risk workshops, meetings and telephone calls. The purpose of this review was to update the PRR which constitutes the record of such reviews. Some reviews served to identify new mitigation measures or to quantify risks. Others served to track progress of identified risks. The report was not solely to ensure the accuracy of the QRA but this was one product of updating the PRR.

15. Were the Risk Treatments mentioned in the Risk Registers evaluated to assess whether it was likely that they would be able to mitigate risk or whether they were in fact doing so? Is so, who did this and when? Were *you* happy that the Risk Treatments were appropriate means of addressing the various risks? Looking at risks 343 and 1101 on page 43 of [**CEC00983221**] (Papers for early July meeting) how do the various risk treatments operate to ameliorate the risks? To what extent were the risk registers revised as the project proceeded?

Risk treatments are actions in response to identified risks. It is not standard practice to evaluate risk treatments in the way the question suggests at project risk level; however this can be done formally as part of audits and peer reviews. Risk treatments are intended to be the most appropriate response to risks at the time those risks are identified and are periodically evaluated and reassessed for relevance and effectiveness as

part of the ongoing risk review process. In respect of risk 343, this was a general delay risk and represented money set aside for unanticipated delays. Risk 1101 related to anticipated problems with BSC commercial management. The mitigation plans for each risk are clearly explained in the report referenced in the question. The risk registers were updated as described in my response to question 14.

16. What was your impression of the state of risk management when you arrived? Were the processes adequate? Had risks been properly identified and evaluated? When you arrived did you make any changes to the processes and/or the assessments that had been carried out prior to that time?

At the time of my arrival my impression of the risk management process was that it was adequate. My approach was to conduct risk management in a collaborative way with the project team. I focused on facilitating workshops and meetings to gain the 'buy-in' from the project teams as I believe this is an effective approach for risk management.

17. When you arrived, did you review the Draft Final Business Case [**CEC01821403**] and, in particular, what it said about risk? In our view, which elements of the project costs and risk evaluation were to some extent the subject of judgment and which were objectively verifiable sums?

Upon joining the project I do not recall reviewing or being asked to review the Draft Final Business Case. I had no involvement in the preparation or review of the draft final business case. See answer 30.

Optimism Bias

18. What is Optimism Bias ("OB") and how does it relate to risk, contingency and provisions when preparing estimates of costs? What is the purpose in making an estimate of the effect of Optimism Bias? Is it managed in the same way as risk?

Optimism Bias (OB) can be described as the inclination for people to be overly positive (or optimistic) when assessing risk and/or making predictions about the outcomes of future planned actions. If, for example, a project manager is overly optimistic about the likelihood of a risk occurring or the impacts of the risk should it occur, it is possible that insufficient attention will be given to mitigating the risk or managing its effect. Through the process of facilitation I used triangulation through group format risk workshops, to ensure various bias and heuristics are tackled as part of the standard risk process in order to combat OB at an individual risk level.

OB studies often use historic data on public project over expenditure to justify its requirement and the purpose of making an OB inclusion in an estimate would be to take this into account and also the inherent optimistic bias of individuals, i.e. project team members.

OB is not managed in the same way as risk.

19. Were you engaged in making estimates of optimism bias for the tram project? If not, are you aware who did this?

At no point during my involvement with the project did I use OB. I am not aware of anyone else doing so. When I joined the project I was advised by Ms Cuckow that OB was not to be used on any of the risk models.

20. How familiar were you with use of Optimism Bias in relation to assessment of building/engineering projects when you started work with TIE?

I hadn't worked on a project that used OB.

21. How was Optimism Bias assessed and how was allowance made for it in the tram project?

It wasn't. See my answer to question 19.

22. As the tram project progressed, guidance as to Optimism Bias and how it should be applied in projects was given in the following publications:

- Mott MacDonald's Review of Large Public Procurement in the UK, carried out for HM Treasury in July 2002 [**CEC02084689**].
- HM Treasury's 2003 Green Book [**CEC02084256**].
- Supplementary Green Book Guidance [**CEC02084818**].
- The Department for Transport's June 2004 Guidance on "Procedures for Dealing with Optimism Bias in Transport Planning" [**CEC02084257**].
- The STAG guidance issued by the Scottish Government in 2003 (updated 2005) [**CEC02084489**].
- The Department of Transport's, Transport Analysis Guidance on "The Estimation and Treatment of Scheme Costs" issued in September 2006 [**CEC02084255**]).

What parts of this Guidance did you have regard to / use and what use was made?

I did not have regard to any of the documents referred to. See my answer to question 19.

23. Had Optimism Bias always been part of the budgeting process for the tram project? If not, when was it introduced? Had a budget/available funding already been established at that time? What was the effect on budget or finding of introducing considerations of Optimism Bias?

I do not know if OB was used on the project prior to my arrival. As per my answer to question 19, it was not used subsequent to my arrival. My understanding is that OB had not been used in the budgeting process; however, it may have been well before my arrival. Notwithstanding this, I was advised on joining TIE, by Ms Cuckow, that OB was not to be used.

24. Did TIE have an accepted strategy or approach that was to be adopted in relation to Optimism Bias?

Insofar as the project was concerned the strategy at TIE in respect of OB was not to use it.

2007

25. In the March 2007 TPB Minutes (TPB Papers – April 2007 – [**CEC00688584**]), can you explain Risk 870 and its treatment (page 25)? How does the treatment mitigate the risk? It does not seem to be that the 'treatment' could ever be said to reduce the risk or the consequence. Similarly, can you explain Risks 139, 164 and 280 and their treatments (page 26)? What assessment was carried out as to whether the treatments would impact on the likelihood of risk materialising or the consequences if it did? Did you carry out a review of the works that had been done before you arrived? If so, what recommendations did you make and what record was kept of this review? Did you have any further information as to how likely it was that these risks would materialise? How were these risks related? The micromanagement treatment for design was behind for months. Did this cause you concern and was it discussed?

I joined the project in May 2007 so cannot answer this question. The cause, risk and effect of risk 870 are described clearly in page 25 of the report. I cannot explain the treatment in page 25. Also the treatment of the same risk is described differently on page 23. The treatment on page 23 appears to suggest that the programme will be realigned with the

new dates for SDS deliverables, although I cannot be certain as I did not prepare this report.

The causes, risks and effects of risks 139 and 164 are described clearly on page 26 of the report. The treatment plans suggest the mitigations were to hold workshops with the contractor and utility companies to review design information in advance of starting work. Trial excavations have also been suggested as a means of discovering what is actually under the ground prior to excavating.

Risk 280 refers to SDS design deliverables not being sufficient quality to allow them to be sent to Infraco for pricing.

The problems with the SDS deliverables were a major concern to the project team and the management were doing their best to address the major issues.

26. **[CEC01630338]** is an example of a QRA analysis from June 2007. Could you explain the contents, the process used to compile it and the outputs derived? Some of the probabilities of risk are very high – 80% to 90%. At this level are they really risks or is the matter one of considering the probable outcome? Where there is such a high risk, say, of inadequate surveys (page 2 – risk 78), why is there not a decision taken to increase the level of survey? This QRA does not make any allowance for failure to transfer risk to the contractor or the problem of changes to scope after the contract is placed. These issues had been identified earlier. Why were they not included in the QRA?

The process of preparing a cost QRA has been explained earlier (question 7).

This does not alter the fact that they are risks as opposed to realities. If they were realities the figure would be 100%. It is still relevant to regard them as risks even although they may be likely or probable. I do not recall why there was no decision taken to increase the level of survey. I do not have enough information available to me at the moment to allow me to determine why that happened, if it did. It is correct to say that the QRA

does not make any allowance for failure to transfer risk to the contractor or the problem of changes to scope after the contract is placed. Risks which were not transferred to the contractor would remain in the QRA. It is not practice to identify a risk allowance and then add on top of that risk allowance a further risk allowance entailing a risk associated with a failure to transfer risk or changes in scope both of which ought to be addressed in the process of negotiation of the contract.

Risk transfer is a risk treatment strategy which requires to be implemented at the time of writing and agreeing the contractor's contract or as a renegotiation/amendment to the contract. Although risks were identified, I was not part of the procurement and contract drafting team at TIE so cannot comment on risk transfer in that respect. It is not best practice to account for scope changes in cost QRAs as the cost QRA is completed in the context of existing scope. If a stakeholder requires additional scope that additional funding must be sought separate to existing funds. If approved and budget included then it should, along with contingency be incorporated into the baseline budget.

27. In the pack of papers for the DPD meeting of June 2007 [**CEC01522629**], there is a copy of the Primary Risk Register. Risks 870 and 280 relate to SDS designs. By this time, the delays with SDS were not truly a risk as they had become real. Despite this, they are still listed as a risk and there is no suggestion that the treatments tried to date have not worked. Why was this?

The delays were still listed on the PRR in [**CEC01522629**] because they continued to be a risk. The delay was a continuing risk as there was scope for further delay. It would not be correct to remove this from the PRR. An open risk on the risk register represents the risk at that moment in time; therefore it is reasonable that it would remain on the risk register as there was potential for additional delay.

28. Why was risk assessment transferred to the Legal Affairs Committee (minutes of 5 September 2007, TPB, [**USB00000006**], page 6)? It does not sit well with the remainder of the remit of that committee noted on page 11.

I do not recall this happening. I do not know who the Legal Affairs Committee are.

29. On 7 September 2007, you sent a sheet with an analysis of risk to Geoff Gilbert and Miriam Thorne [**TIE00060959**]. Can you explain the figures in the attachment [**TIE00060960**]? How were they produced and what use was made of them? What did you mean by "headroom which we may have within the current risk allocation"? You then revised the figures and re-sent them on 10 September 2007 [**TIE00350211** and **TIE00350212**]. What was the change made and why was it necessary? On 27 September 2007 you sent a further set of figures for CEC [**TIE00061009** and **TIE00061010**]? Why were the figures for the Council different?

TIE0060959 should be TIE00060959

The spreadsheet in [**TIE0060959**] is a cost QRA with a project risk allowance. I have explained what this is in my answer to question 7. I am unable to recall the exact details of why there are various revisions of the spreadsheet or why the numbers changed. I can say that the production of the spreadsheet was a continuing ongoing process until the point of Financial Close and the inputs were subject to change as the process evolved. The phrase "headroom which we may have within the current risk allocation" means that if certain risks were closed and/or transferred to the contractor then the allowance against those risks would be removed from the risk allowance. One reason might be that the allocation of risk would change as negotiations progressed.

30. On 12 September 2007, you emailed Geoff Gilbert and Miriam Thorne querying the decision not to use Optimism Bias in the project [**TIE00350236**]. Why were you concerned? What response (if any) did you get?

I cannot recall if the email dated 12 September 2007 was in response to another email which I do not have sight of. However, I am prompted by the 12 September 2007 email to recall that I raised OB. However, in the absence of any precipitating or responsive email I cannot comment on the content.

31. In late October/early November you participated in the Gateway 3 review and met with the persons carrying out the review to explain risk management in the project. What material did you provide to them? What questions were you asked by them? How many meetings did you have with them and how long did they last? The Gateway 3 report [**CEC01562064**] notes that some risks which arise have not always been immediately incorporated into the risk registers (page 6 p, paragraph 10). What were the risks in relation to which this had been noted? Was action taken on the basis of this to change procedures in this regard? What was done?

My recollection is that the Gateway 3 review lasted approximately five days and involved an intensive audit of the process by the consultants involved. The process involved many meetings and production of a variety of documents and information. I provided them with any information sought and met with them on each day of the review, sometimes for several hours. It is impossible to recall the specific questions asked. This was a lengthy process. One area of improvement which was identified was that some risk information may not have made it to the attention of the board. This problem was addressed by improving the process of reporting to the board as described in my response to question 5. I would also note that the Gateway Review report [**CEC01562064**] refers to the "very good work which is being done by the Risk Manager" (page 7).

32. In the PowerPoint presentation to the joint meeting of the TPB and TIE Board in October 2007 [**CEC01358513**], the estimate of £498m for phase 1a is said to include 15% risk and contingency (page 51). Where did this figure come from

and how was it made up? The next page has a different flat-rate figure of £49m. Where had it come from? Was there any discussion of the fact that these assessments were inconsistent? There is reference to provision for risk on a P90 or P95 basis. Did you prepare figures on this basis?

The standard approach to a cost QRA exercise would have been taken and information provided to the Finance team. I do not recall ever seeing the PowerPoint presentation referred to.

33. The MUDFA Risk Register for November 2007 [**TIE00350880**] includes a number of matters which had become a reality rather than a risk by that time. This was true of discovery of additional assets and need for different diversions as well as the inability/refusal of SUCs to turn around plans for approval within the require time frame. Despite this, they are still listed as risks and have an assessment of probability. Why was this? Also, at this time it was apparent that the design would not be completed to the extent planned at the time of conclusions of the Infraco contract. What impact did this have on risk and OB and the documents that had been produced to analyse them? Did it indicate that risks had been underestimated or that there had been optimism as to the extent that they could be mitigated and/or the design process brought back on track?

The answer here is the same as the answer to question 27. Even after a risk becomes a reality, there remains a risk that the issue identified may recur or increase. For example, because an excavation uncovers unexpected utilities at one location, it does not remove the risk of uncovering other unexpected utilities.

34. On 14 December 2007, you were sent risk allocation matrices by DLA [**CEC01430991**, **CEC01430992** and **CEC014309913**]. What was the intended function of these? They appear only to indicate on which party each clause of the contract places obligations. The 'failure' aspect simply supposes a failure

CEC014309913 should be CEC01430993

by the party to implement their obligation. Do you agree? Did you get a separate document that considered not just failure to implement obligation but other risks and how they would be addressed under the contract?

I had no input in the matrices at [**CEC01430991**, **CEC01430992** and **CEC014309913**]. I cannot assist with this and think Andrew Fitchie would be better placed to do so.

CEC014309913 should be CEC01430993

35. In 2007, there were two versions of the Final Business Case. Version 1 from 3 October 2007 [**CEC01649235**] and Version 2 (the Final Version) on 7 December 2007 [**CEC01395434**]. The differences between them in relation to risk are minor. In paragraph 11.4 they state that guidance from Audit Scotland and the Holyrood Inquiry has been relied on. Can you explain was guidance was obtained from these sources?

No I cannot. I did not prepare the documents [**CEC01649235** and **CEC01395434**].

36. Although it is describing events before you joined TIE, can you comment in the discussion of the Draft Final Business Case in paragraphs 10.8 to 10.14 of Version 2? What was your view of the choice of a 90% confidence level? Did you consider the output of the QRA to be robust at that level? Were you surprised that the risk estimate at the P90 level was just 12% of the project costs? Would you have expected this? Did you verify this? In that there had been slippage in design and MUDFA since those figures were prepared, did you consider that there might be a problem?

I did not review this document immediately following my arrival. I can only comment on these matters with the qualification that my comments are made in retrospect.

The figure of 90% represents a high level of confidence. It is consistent with the range of figures which would be acceptable with reference to

industry practice. However for this stage of a project (pre-construction) the figure of 12% appears to be below industry guidance. I did not verify the numbers as they were changing continually as the negotiations progressed and risk allocation was updated. Following my arrival I was more concerned with ensuring the numbers used in QRAs' prepared by myself were accurate as these were the numbers which would be used in reports and by the finance team for budgeting purposes.

37. Paragraphs 11.16 appear to proceed on the basis that the contracts are negotiated so not risk allowance is required. Do you agree? Can you explain what is meant by paragraphs 11.17? What if the contractor did not accept SDS design? What was the outcome of the contractors' due diligence exercise in relation to design?

The procurement strategy was to transfer as much risk via contracts. This was led by the procurement team and TIE's lawyers rather than the risk manager. The interpretation of the paragraphs identified was a matter for them. I have no knowledge of the contractors having exercised due diligence or not.

38. Can you explain the contingencies and the way that they were made up as described in paragraphs 11.40 to 11.42 in Version 1/paragraphs 11.39 to 11.41 in Version 2?

I did not prepare this document and cannot comment.

39. The FBCs note that OB had been 'eradicated' by the time of the Draft Final Business case (Version 1, paragraph 11.43 and Version 2, paragraph 11.42). Did you consider that it had been eradicated? What was your basis for this? The FBCs refer to discussions with TS and CEC. Were you party to these? With whom and when did the discussions take place?

As per my answers to questions 18-24 OB was not undertaken. It was not there to be eradicated. I was not party to the discussions referred to and cannot comment.

40. Both versions note that the contracts are bespoke (paragraphs 11.47 and 11.46) and refer to risk allocation matrices. What allowance was made for the danger that risk was not allocated as intended?

The risk allocation matrices are the ones referred to earlier which were supplied by Andrew Fitchie. I do not consider it reasonable that a risk analysis would make an allowance for the eventuality that the risk allocation matrices provided by their lawyers would not be reflected in the contracts prepared by the same lawyers.

41. In 11.71/11.70 there is a note of the Risk if further design changes are instructed. What was done to control this risk? Some suggestions are made in paragraphs 11.75/11.74. Is this everything? As it was known by then that the design was late, what effect did that have on this risk? Were the measures noted above relevant to address the issues arising from late design? What changes were made to the allowance in respect of this risk as the design timetable slipped time and time again? There is no mention of the late design and the effect it might have in risk section of the FBC. Why was that?

The risk of stakeholder/client changes was to be controlled via the change control process that included a Change Control Panel which was responsible for reviewing and either approving or rejecting each change request. The project team did their best to minimise this type of change. One way this was managed was by the early introduction to the project of Transdev. The idea behind this was that by having the operator on board during the design phase, this would eliminate change requests at a later date.

The project management team were doing their best to manage the late delivery of design. This was being managed at the highest level of the project team and involved micromanagement and monitoring of the design deliverables.

At the time of this report being prepared the team were confident they could minimise change on the project.

42. Can you explain what is meant by paragraphs 11.77/11.78?

No. I didn't draft paragraph 11.77. The terms at 11.78 are self-explanatory.

43. Version 2 concludes that there is 29% headroom (paragraph 11.44) whereas Version 1 says 26% (paragraph 11.45). Can you explain the difference?

No and the documents provided do not assist me in my efforts to provide an answer.

2008

44. In January 2008 work was progressing towards the close of the Infraco contract. On 23 January 2008, you sent an email with attachments to Susan Clark [**TIE00351138**, **TIE00351139** and **TIE00351140**]. The Risk Management report suggests that as a result of conclusion of the contract, certain risks could be closed and that the risk provision could be released so as to become available to meet contingencies. Which risks did you consider could be closed on the basis that they were no longer likely to arise? What did you mean by your statement that there could be such a release, "provided the contract is 100% fixed and firm thereby eliminating all the Infraco (and other) procurement related risks".

If risks were transferred to others then they would no longer be our risks. The procurement team determined which risks to close and instructed me accordingly. They could then be closed on our PRR. Such risks are outlined in the report. An obvious example might be a risk relating to procurement which would be extinguished by the effective procurement.

45. On 5 February 2008 Susan Clark sent you an email with an attachment which consisted of a risk register on which CEC had marked comments [**CEC01508100** and **CEC01508101**]. The second risk in the table – Risk 286 – deals with delay in signing the contract because of lack of confidence on the part of Infraco in the SDS designs and the delay that this might cause to conclusion of the contract. By this time, was it not apparent that this was no longer a risk and had become a reality? How was this reflected? The CEC comment notes that they want a price for each month's delay. Was that provided? You emailed Geoff Gilbert and others in relation to this on 6 February 2008 [**TIE00351263**]. The table notes that this risk was not included in the QRA. As that was so, how was the cost of this risk reflected in the financial forecasting and reporting for the project?

Yes it had been identified that this risk had become a reality however, as stated in my response to questions 27 and 33, although a risk has become a reality it is not necessarily the case that the risk should be removed from the PRR. I am referred to [**TIE00351263**]; Stewart McGarrity took this issue up and would be better placed to assist.

46. In the same document, risk 870 relates to late delivery of designs. This was clearly already a problem by early 2008 and had been considered often by the Tram Project Board in 2007. Was it still appropriate to present it merely a risk (albeit one with a high probability)? As the risk had been realised, was further consideration given to the proposed mitigation measures – whether they worked and whether they were sufficient?

Yes it was appropriate to continue to regard risk 870 as a risk. As per qq 27, 33 and 45. At the time design information was still being received and so this was an ongoing risk. Steven Bell was responsible for the consideration and implementation of mitigation measures and would be better placed to answer that aspect of the question.

47. Again, in the same document, risk 164 relates to discovery of unexpected utilities. That had by then become a reality. A GPR survey had been carried out but is still being presented as a mitigation measure. Why was this? Did you have any feedback about the results of trial holes?

A GPR survey is conducted using a ground penetrating radar. The radar scans the ground to determine what is underneath. GPR surveys were necessary throughout the tram route and although some had been carried out there were more to be conducted as there was a continuing risk of encountering buried utilities. Buried utilities were therefore a risk which could not be removed from the register until project completion.

48. Risk 47 in relation to the design review process is rated with a probability of 50%. Was it not the case that by this time the substantial shortcomings with the design process had become apparent? What relevance were the proposed mitigation measures to what was actually happening?

Significant resources were applied to managing the problem. From recollection there were several people involved in its management. The management process was hampered by the ongoing delays in the design process. The identification of this issue did not mean that by that time were such that no person in TIE could do anything other than apply pressure to those involved in the design to expedite matters.

49. In preparation for Financial Close, on 11 February 2008 Stewart McGarrity sent you a spreadsheet providing budget figures for close. You replied the same day

noting that there was risk information that you were not aware of [**CEC01489953**]. You were the risk manager. Were you surprised or concerned that changes had been made to risk figures by someone other than you and that you had not been consulted? Did you get a satisfactory response to the issues that you raised as to the reduction of risk allowance despite the fact that the risk had not been transferred or closed? What would the effect have been of the steps that had been taken? At the end of the attachment to your email [**CEC01489953**], there is a small table relating to risks arising from the Schedule 4 Part 1 Base Case, Assumptions. Who identified which risks were to be included here? Were you provided with a copy of that schedule and, if so, when? Were you provided with copies of further versions? The Assumptions included (or came to include) that MUDFA works would be complete and, putting maters shorty, that there would not be design changes. Did you take account of or value these risks?

Reading through the emails it looks like the reason that I raised the issue was that, as risk manager, I was curious, and wanted to understand why the QRA had changed. I do not recall receiving a response to my questions via email. As I cannot recall a response I cannot say what the effect would have been of the steps that had been taken.

The attachment referred to is not available via [**CEC01489953**] and so I cannot comment on it.

50. Can you comment on the risk matrix that was produced for Contract Close [**CEC01430993**]? What was the intention behind it? Was it you or someone else that requested it? Was this what you wanted/expected?

I have no comments regarding document [**CEC01430993**]. It was prepared by DLA Piper. I did not ask for it nor did I expect it.

51. Shortly before Contract Close, on 3 April 2008 you had an exchange of emails concerning the allocation of certain risks [**CEC01351142**]. You refer here to

3 April 2008 should be 30 April 2008

having reviewed materials. Was the material that you had reviewed a clause by clause analysis of the contract such as that referred to in the previous paragraph and in paragraph 34? Were you made aware why it was that risks that had been allocated to the private sector were now shared with the public sector? Was it as a result of changes in the contract wording? Did you get a response to your message? What was your response to the query from Susan Clark?

The material reviewed was not a clause by clause analysis of the contract. The document referred to was a DLA risk allocation matrix.
The DLA matrix identified which clauses in the contract were private, shared or public requirements. During the email exchange referred to I identified where the responsibilities had been changed from previous versions (of the DLA risk matrix). I wanted to ensure the project directors understood these changes had been made.
TIE's PRR did not include private risks as they were not ours. Any response will be contained within the email chain.

2009

52. On 26 January 2009 you sent an email to Hazel Kennedy [**TIE00330095**] in which you noted four high level risks that were facing the Infraco team. What was the purpose of this email? Can you explain the first and fourth risks? What was the position at the time? What effect was it having? Was it quantified and added to risk register? Can you explain the third risk? Again, as the time for commencement of Infraco works had passed and MUDFA was not complete, was this not a situation in which Infraco works *had* been affected rather than there merely being a risk of this?

The four risks I identified in email [**TIE00330095**] were being highlighted in this email for inclusion in the Infraco Director's monthly report. This was done after discussion with the Infraco Director.

Risks 1-4 were risks relevant to the impending close. The position at the time was that the contractors had begun to raise issues. The risks themselves are self-evident.

Risk 3 was ongoing. Infraco works had been affected by MUDFA but there was a continuing risk that this could happen again.

53. You sent similar emails concerning this on 11 September 2008 [**TIE00328707**], 25 February 2009 [**TIE00332677**], 23 April [**TIE00333074**], 20 May 2009 [**TIE00333366**] and 18 June 2009 [**TIE00333708**], 12 August 2009 [**TIE00337272**], 7 October 2009 [**TIE00337916**], 4 November 2009 [**TIE00338179**], 28 January 2010 [**TIE00339059**], 24 February 2010 [**TIE00339369**], 21 April 2010 [**CEC0076638**], 17 June 2010 [**TIE00343607**], 15 July 2010 [**CEC00392842**] and 7 October 2010 [**TIE00345915**]. These note that the high-level risks were reviewed by the Risk Manager and the Infraco Director. How did you decide which were the high-level risks? Who reviewed the others? Why did you specifically identify the risks currently facing the Infraco team? What was done with that information?

CEC0076638 should be CEC00352255

The documents referred to are standard monthly reports. The answer is the same as the answer to question 52.

54. By September 2008 [**TIE00328707**], there was an issue of, "Lack of visibility of design changes between November 2007 and May 2008". What did you mean by 'lack of visibility'? What had brought this to light? What was done to put a value on this risk? The email from September also notes the risk that MUDFA do not finish works prior to Infraco commencing work. By this time, the Infraco contract had been awarded and works were intended to be underway. The MUDFA works were not complete. Was this really a 'risk'? In the email of 23 April 2009 and later, there is reference to TIE ensuring that Siemens meet their requirements with regard to risk management. To what is this referring?

'Lack of visibility' refers to the design changes between the contract award and Financial Close. I don't recall what brought this to light. It is unclear whether the question is seeking to put a risk valuation or a finance value on the risk. If the former then a risk rating of 23 was applied. Re MUDFA and Infraco this is dealt with in my answer to question 52.

The reference to Siemens meeting requirements was a reference to a concern that Siemens & Bilfinger Berger were not meeting their risk management requirements set out in the Employers' Requirements. There was an effort to have them do so.

55. On 22 April 2009 Stewart McGarrity sent you an email with attachments dealing with reporting of risk [**TIE00088999** to **TIE00089002**]. What had given rise to this email – was the problem that it had come to light that inconsistent reports of risk and QRA were being provided? As risk was part of the budgeted outturn cost, why was that not being updated as new estimates of risk became available? What accounted for the increase in QRA/risk allowance rom £30.3m to £59.8m? Where you involved in preparing the new figure? The second attachment – [**TIE00089001**] – states that if all commercial disagreements went against TIE, the additional cost would be £12.7m. Where did this figure come from? Why was the updated figure not being reported to Transport Scotland? Why was there no other QRA/Risk Allowance that was approved other than the one from Financial Close? Why was approval not being sought as the figures changed? In the first of the attachments [**TIE00089000**], why has the probability confidence level been changed to include P30 and P50 as well as P80?

I do not know what gave rise to Stewart McGarrity's email of 22 April 2009; however, it appears he was preparing a report which highlighted a range of potential project outturn costs. He correctly points out that the only approved QRA was the one at FC (and this allowance had been reduced following risk drawdowns) however as the project had progressed, the QRA

risk exposure was now greater than the remaining allowance left in the budget.

Stewart notes he has used my QRA and after some adjustments the figure was now £59m. He refers to CEC requesting a worst case scenario therefore this may be what gave rise to the email.

I do not recall where the figure for the commercial disagreements going against TIE came from. I would suggest it came from the commercial team.

I regularly updated the cost QRA and shared it with the project directors. It is not common practise to continually seek approval for a new risk allowance each time QRA is conducted as this is a measure of the current risk exposure.

As far as I can recall, the P30 and P50 figures were included for additional information. I do not recall who requested this as I was simply asked to include them.

56. Stewart McGarrity sent out further figures for cost estimate and risk allowances on 2 July 2009 [**CEC00766380** to **83**]. Why was he providing this information to you? The first attachment [**CEC00766381**] has estimates to April 2009 and further projections for the best, mid and worst figures. In these projections, why do the base costs remain the same and only the risk allowance change? This gives the impression that the only matter that changes depending on the approach taken is the risk allowance. Would the actual costs also change as well as the risk allowance? For example, the change in figures for the BDDI to IFC issue is from £2.8m to £38.8m. That issue was already live so it was not really a 'risk'. Is this not the range of likely outcomes of that dispute rather than the range of allowances that might be made depending on the approach taken? In this attachment, various figures are given for the changes in a tab called "Ranging Doc – Change". Where did this data come from?

As with Q.55 I would suggest Stewart was continuing to establish what the eventual project costs would look like.

I don't know where the data in a tab called "Ranging Doc – Change" comes from as I was not involved in its preparation.

Regarding the change in figures for BDDI-IFC, if there was certainty around these costs then I would have expected to see them added to the cost estimate rather than included in the risk allowance.

57. In the risk tracker [**CEC00766382**] attached to the email, it is possible to track the marked increases in sum allowed for risk 343 (general delay to programme), risk 974 (Inaccurate Topo Survey Reports) and, in particular, risk 1077 (lack of visibility of design changes between November 2008 and May 2008). The last of these reflects an increase from £6m to £20m. Can you explain what issue which risk was valuing? How was this increase being valued? What was the intention as to what would be done with these figures once you and others had worked on them? Was it the case that these figures made it apparent that the project would not be completed on budget?

Given the passage of time, I cannot recall the figures. If I changed them during the risk review process it is likely that it was done in the light of new information as the project progressed, however, I cannot recall the specific detail of that now.

58. Can you explain the comment in your email of 4 November 2009 [**TIE00338179**], "A review of the Infraco risk allocation (QRA) is underway and has progressed in Period 8 with the Commercial Manager, Risk Manager and Deputy Finance Director"?

This comment is self-explanatory and was part of the Infraco Director's periodic report to Steven Bell. The same report referred to it at questions 52 and 53.

59. [**TIE00338607**] is an email from you dated December 2009 in which you provide draft wording in respect of the failure of BSC to implement the Risk

Management elements of their contract. In what respects had they failed to comply with the contract? How did that failure relate to the earlier failure by SDS to conduct risk management? What was the effect of the BSC failure? What was done in relation to the failure and what was the response of the consortium? Was it necessary for TIE to take over the role that had been intended for BSC?

The wording of email [**TIE00338607**] explains the extent to which BSC had failed to comply with the risk management section of the Employers' Requirements (also referred to at question 54). The Employers' Requirements obliged BSC to maintain an Infraco Risk Register (among other requirements) and they were failing to do so I don't recall seeing a response. TIE could not have taken over this role. It would have been impossible for TIE to assume responsibility for the contractor's contractual requirements.

I confirm that the facts to which I attest in the answers contained within this document, consisting of this and the preceding 52 pages are within my direct knowledge and are true. Where they are based on information provided to me by others, I confirm that they are true to the best of my knowledge, information and belief.

WITNESS [redacted]

DATE 20.6.17