EDINBURGH TRAM INQUIRY

TONY GLAZEBROOK

1. Prior to joining TIE:

(1) What were your main qualifications and experience?

BSc Electronic Engineering Southampton University, Chartered Engineer, Fellow of the Institution of Electrical Engineers, Fellow of the Institution of Railway Signal Engineers. 45 years of railway systems experience – including managing large organisations to over 600 staff

(2) What was your experience in major transportation infrastructure projects, including tram and light rail schemes?

45 years of railway systems experience – managing large organisations to over 600 staff. Managing large railway signalling and telecommunications research, design, construction, testing and maintenance teams around the UK.

(3) What are the main similarities, and differences, between heavy rail and light rail schemes? To what extent is experience in heavy rail transferable/relevant to light rail?

Broadly, the systems are very similar, the details, risks and applications differ. Hence, past mainline rail experience is highly transferable to light rail & tram projects.

2. During your employment with TIE:

(1) What were the circumstances of you joining TIE (e.g. were you approached by TIE or did you apply by open competition for an advertised vacancy etc)?

Through David Crawley of Xanta Ltd, who had been engaged directly by tie.

(2) What was your job title(s) at TIE and between what dates?

Engineering Services Director, beginning of Feb 2007 to end March 2011.

(3) What were your main duties and responsibilities? Did they change over time?

Throughout the project to ensure that the overall system design met all engineering acceptance and approvals criteria.

(4) To whom did you report and who reported to you?

Reported to Tram Project Director; I managed approx 10 staff.

(5) What were your first impressions when you joined TIE, including the adequacy of the design team in TIE, the state of design for the project and, more generally, TIE as an organisation?

tie did not have a design team from the outset. It had an engineering acceptance and approvals team, managed by David Crawley and I. The team was strengthened over the 4 years I worked there, to reflect workload and specialism needs.

(6) Did you receive a briefing when you joined TIE (and, if so, from whom and what was said)?

From Steven Bell and David Crawley. Content was general.

Design Overview

It would be helpful if you could provide an overview of the matters in this section. In answering the more detailed questions later in this note please, of course, feel free to refer back to your answers in this section if you consider that they adequately answer the more detailed questions that follow.

3. In September 2005 TIE and Parsons Brinckerhoff (PB) entered into the System Design Services (SDS) contract (CEC00839054).

We understand that work in relation to the Requirements Definition phase took place between September and December 2005 and that a Preliminary design package was delivered to TIE around late June 2006.

On 6 December 2006 Scott Wilson produced a Preliminary Design Review Validation Report (PBH00026782) in which it was stated, in the Executive Summary, that *"Our overall conclusion is that the bulk of the Preliminary Design submission is now either acceptable or acceptable given the responses from SDS".*

We understand that Detailed Design then took place but that there were difficulties and delay in progressing and completing the Detailed Design for the tram project.

By way of overview:

(1) What was your understanding of the main difficulties and delays encountered in carrying out the design work?

The poor relationship that SDS had with tie, Utility Companies and CEC, largely through inadequate specification compounded by constant meddling, delayed problem clearance, unclear/missing/duplicative roles and responsibilities.

(2) What were the main reasons for these difficulties and delays?

Poor Utility performance due to their inadequate records and processes.
CEC "we won't tell you exactly what we want but when you make us a proposal we'll tell you

what's wrong with it" approach.
Tie organisational confusion – it was as though everyone was encouraged to meddle with every conceivable aspect of design, regardless of their role, knowledge and experience.
Sometimes inadequate SDS resource.
Poor tie/SDS liason leading to mutual distrust.

(3) What steps were taken, and when, to address these difficulties and delays?

When Matthew Crosse was the Project Director he supported our process improvements.

(4) Were these steps successful (and, if not, why not)?

Initially yes. Had assigned management roles been followed they would have remained so. But the tie organisation grew and became confused, thereby negating and reversing many previous improvements to overall performance.

4. In relation to the design for the utilities diversions:
(1) Which party was responsible for producing the utilities design?

SDS – comprising Parsons Brinckerhoff, augmented by their subcontract with Halcrow.

(2) What was your role, if any, in relation to utilities design?

Helping to unblock elements of the design process where it was perceived that SDS was at fault.

(3) What was your understanding of the main difficulties and delays encountered in progressing and completing the utilities design?

The Utility Companies varied in the effectiveness of their processes and the coverage and accuracy of their records. Worst were Scottish Water, best were Scottish Power and the Telecomms Companies. Some were helpful, some were unhelpful. There was much more buried than expected, and very often not to the expected profile.

(4) What were the main reasons for these difficulties and delays?

Processes and as-built records within the Utility Companies, causing constant rework;

(5) What steps were taken, and when, to address these difficulties and delays?

Outwith my purview and control.

(6) Were these steps successful (and, if not, why not)?

Clearly not!

(7) To what extent, if at all, did the difficulties and delays encountered with the utilities design affect the civil engineering (i.e. non-utilities) design?

Produce consequent delay due to excessive design and management resource demand from constant Utility design rework.

5. In relation to ground investigations etc to inform the design:

(1) What was your understanding as to which party was primarily responsible for instructing ground investigations etc to inform the design (including both the civil engineering design and the utilities design)?

SDS

(2) Were any difficulties encountered in that regard?

Not to my recollection.

(3) Do you consider that sufficient ground investigations were undertaken, at a sufficiently early stage in the project?

Yes, in my recollection in respect of structures and trackform.

6. In relation to the performance of the SDS provider:

(1) What were your views, in general, on the performance of PB (and their sub-contractor, Halcrow)?

Aside from intermittent resource issues they were adequate. Because of the constant delays and rework it was difficult for SDS and Halcrow to maintain unchanging resource.

(2) What were your views on the extent to which the delay in producing, progressing and completing design was due to the SDS provider?

SDS had to contend with unclear/inadequate specifications, inadequate Utility performance and constant interference in the acceptance and approvals process.

7. A number of documents note your concerns in relation to the performance of TIE.

For example, on 4 April 2007, in an e-mail to David Hutchison, PB (PBH00010291), responding to Mr Hutchison's letter asking for a speedy resolution of many Requests for Information, you stated, *"It is patently unacceptable that these have been held up by TIE or its agents for so long"*.

In an internal PB e-mail dated 10 April 2007 in the same chain, Steve Reynolds noted that you had recently commented to him that TIE were in *"confusion and disarray"*.

In his internal Weekly Report dated 1 June 2007 (PBH00025126) Mr Reynolds noted that you and David Crawley were *"developing misgivings about TIE's organisational capabilities"*, that you were both concerned about TIE's *"failure effectively to manage the complexities of the Tram Project"* and that you had expressed frustration *"at the lack of clarity on TIE's SDS Project Management role, citing several examples of meetings conducted by Susan Clarke, (MUDFA), Geoff Gilbert and Matthew Crosse on issues which impact SDS contract management without involving [you]"*.

In an internal PB e-mail dated 29 November 2007 (PBH00014776) Jason Chandler noted that you

spoke your mind, that *"To date that has meant that he has said very bad things about tie"* (Mr Chandler further noted that, *"as usual what he has said is absolutely correct"*).

(1) Did you have concerns in relation to TIE? If so, what were your main concerns and what difficulties did these matters cause? Were your concerns ever resolved to your satisfaction (and, if so, when and how)?

Yes and I raised them with Matthew Crosse who was sympathetic. Subsequent Project Direction and Executive action confused or even countered any improvement and caused further organisational confusion and project delay.

(2) What were your views on the extent to which the delay in producing, progressing and completing design was due to TIE?

Some was due to tie; our role was to find ways to improve the processes within our control.

8. In relation to CEC and third parties (including the statutory utility companies, Network Rail, Forth Ports and BAA etc):

(1) What were your views, in general, on the input of CEC (both as client and as statutory approval authority) in the design process?

CEC had much valuable and transferable experience. However, instead of using that to lead the design through clear and practical specification (ie leaving scope for sensible SDS interpretation), it directed its energies into constant interference and rejection of offered design.

(2) What were your views on the extent to which the delay in producing, progressing and completing design was due to CEC?

A very significant factor.

(3) Similarly, what were your views, in general, on the input of third parties to the design process?

As previously stated above in respect of the Utility Companies. tie's organisational confusion and management approach caused extensive delay to design completion and acceptance. In addition, and in respect of the main project construction contract, it appeared that the 'bespoke' construction contract was flawed fundamentally in that from the very outset the construction consortium was free to to drive constant and all-embracing change. It is especially notable that the only part of the entire project that proceeded to cost and timescale was that of tram vehicle procurement – the only element with minimal tie and CEC involvement!

(4) What were your views on the extent to which the delay in producing, progressing and completing design was due to third parties?

As already outlined above.

In the following sections we consider events in each of the years 2007 to 2011 in more detail

2007

9. By e-mail dated 23 February 2007 (TIE00042382) Jim Harries, Transdev, attached a draft Proposal for TIE's Design Review Process (TIE00042383). The draft Proposal noted, in the Introduction, that *"The delivery of Detailed Designs by SDS has started, but currently tie does not have a satisfactory process in place to review these designs."* ***That is why the new Engineering Acceptance & Approvals group was set up at that time.*** It was noted, under Risk Transfer, that *"Currently TSS has been asked to undertake a 100% check of the Detailed Design, and underwrite the design. The process that is set out in this document is likely to be considerably less than a 100% check, and consequently some risk will be transferred from TSS to tie".* ***It would have been a fundamentally flawed process for any organisation to 100% check the design output whose contractual responsibility lay with SDS. What was required was for SDS to design and demonstrate compliance with requirements and standards. That is where TSS resource should have been directed.***

An e-mail dated 2 March 2007 from Orla O'Regan, TSS (TIE00040945), attached copies of Dashboards produced in December 2006 for the Overall Project (TIE00040946) and for the SDS contract (TIE00040947). The Design Dashboard noted that 28.3% of Detailed Design had been undertaken against a Planned figure of 71.9%. ***This was because of constant rework driven by organisational and role confusion within tie, CEC and TSS and a failure of those organisations to facilitate problem resolution collectively.***

The minutes of the Design Procurement and Delivery Sub-Committee on 13 March 2007 (CEC01361501) note (page 6), under Design Assurance, that you presented a paper outling proposed key changes to the design approval process.

By e-mail dated 23 March 2007 (CEC01628233) David Crawley attached a list (CEC01628234) of outstanding major critical issues to be discussed at a meeting on 29 March 2007. Mr Crawley noted that *"a decision, even if sub-optimal in the first instance, will allow faster progress to be made through subsequent change control than delay for a 'better' decision"* ***This is an absolutely practical and a long-established principle that applies to most projects, but that was rejected by tie and CEC.*** . The e-mail also noted that while a definitive and final decision on some issues would not always be within TIE's gift, it would be possible for TIE to make an interim 'decision' to give direction.

A draft update by Mr Crawley to the meeting of the DPD Sub-Committee on 10 May 2007 (TIE00064787) noted, under Design Assurance, that *"Agreement has now been reached with SDS on the provisions of designs accompanied by design assurance documentation. This will result in packages of designs being supplied, section by section, in a form which is self-consistent, complete (or if not, with defined status), with interdependencies already reviewed and with associated approvals. The package will also contain associated TRO information although until the full modelling execricse has been concluded this cannot be finally confirmed ... Overall there are likely to be about 40 such packages"*

It was noted, under Design Deliverables progress reporting, that there were 5,373 items of contracted milestone deliverables related to the 40 design assured packages.
It was further noted that *"There is an important conclusion from this Dashboard – the rate of delivery from 'Now' must effectively double if the programme is to be met. This does not necessarily imply that actual work rates must increase as to meet this Deliverables rate requires that a large proportion of the Deliverables affected must be at an advanced stage of completion already"*.

A draft update by yourself and Mr Crawley presented to the meeting of the DPD Sub-Committee on 7 June 2007 (CEC01528966) included a table (at page 52) which showed that the critical issues had decreased from approximately 80 on 19 February 2007 to about 15 on 21 May 2007. ***This was due to the pro-active approach introduced by David Crawley.***

Slides prepared to brief Audit Scotland in June 2007 (CEC01674236) noted (page 5) that there were 19 Design Assured packages covering the whole tram system, with the first package due in July 2007 and the last due in November 2007 (with each package containing approximately 100 drawings, 25 documents and documentary evidence) and were noted to be a *"Key contributor to creation of Infraco confidence and low price"*. It was noted (page 9) that slippage was due to three reasons, namely, a logged critical issue, a TIE Change Notice having the effect of changing the scope and slippage within the PB SDS contract performance, that these issues were now well understood and that the principal blockers (Critical Issues) were being removed systematically. ***Absolutely correct.***

An e-mail dated 22 June 2007 from Matthew Crosse (CEC01640587) forwarded an e-mail in which David Crawley noted that there had been significant improvement in the critical issues, which was due to *"(1) A renewed focus on the need for progress. (2) A decision that items at PD1 should be progressed to the Detailed Design phase despite not having been through the modelling of PD2 phase. This does of course introduce risk, but it is likely to be minimal overall, and in many cases sensibly zero as often no alternative physical design solutions are possible anyway. (3) The right people being present at the meeting"*.

In his e-mail Mr Crosse observed, *"It is good we (i.e. tie and CEC) are now being far stronger in respect of decision making. Particularly, acceptance that some decisions need to be forced – sometimes prematurely – in order to allow the detailed design to get started. And yes, they do carry itinerant levels of risk and some locations might need reworking"*. ***Absolutely correct.***

A letter dated 11 July 2007 from Steve Reynolds noted that SDS had now remobilised those areas of design activity that had been held awaiting resolution of the Critical Issues (PBH00003595). The letter noted that *"For the avoidance of doubt we understand that should it be decided subsequently to revisit the design, (other than for reasons of non-compliance with standards), the risk of programme prolongation and increased costs remains with tie"*.

The minutes of a Design Review Meeting on 18 July 2007 (TIE00044271) noted that 18 packages of self-assured design was not now possible and that the route would be split into 14 subsections and, further, into 63 batched sub-sections.

A progress report to the DPD Sub-Committee on 30.8.07 (CEC01530449) noted (page 12) that *"Previous reports have concentrated on activity designed to remove blockages to progress, most*

notably the critical issues, the last of which was removed, for all practical purposes, on 28 June 2007".

(1) Do you have any general comments on the matters noted above?

Included above thus within the originating text.

(2) What was your understanding when you joined TIE of the main reasons for the delay in progressing Detailed Design?

Distrust and confusion between SDS, tie and CEC

(3) What was your understanding of the main outstanding critical design issues and why they were outstanding?

They were all well-known at the time but each party blamed the other(s) for the lack of progress in resolution. The distrust between parties was very clear.

(4) What steps were taken to resolve these matters, including what changes were made to the process for the production and review of design?

Introduction of the Critical Issues clearance process plus increased clarity of content and engineering roles and responsibilities around the design review and acceptance processes.

(5) Were these steps successful?

Yes

(6) In general, and with the benefit of hindsight, to what extent were the various critical issues truly resolved at this stage and to what extent were they resolved on the basis of assumptions that turned out not to be correct or which required to be changed?

The majority of issues were resolved fairly quickly and ways forward determined once the improved process was introduced. However, the nature of the tie/TSS/CEC/TEL organisational and role confusion meant that people felt able to reopen otherwise closed issues repeatedly for their own reasons.

10. In an e-mail chain in early March 2007 (TIE00067553) Alex Joannides, TSS, noted that, contrary to the understanding of Ailsa McGregor, *"no detailed design submissions whatsoever"* had been sent by SDS to CEC for comment. Mr Joannides also noted that, in relation to roads design, there had been instances where TSS's comments conflicted with those of CEC, there were cases where CEC Planning conflicted with CEC Transport and he was unsure of the whether TEL were being involved in the process.

In an e-mail dated 12 March 2007 in the same chain you noted that *"our objective should be to get to SDS as early as possible the clearest possible view of requirements on design, be they from CEC or any other source ... Our new focus is not to do 100% design review, rather to look at carefully*

selected critical deliverables in packages, each being accompanied by a design assurance pack ... Currently I am unclear what CEC's expectations are for review. If CEC is still thinking of 100% review then there is a great risk of every design being delayed or unreasonably reopened".
An e-mail dated 16 March 2007 from Gavin Murray, TIE (TIE00041002) noted that a package of documents had been issued to Andy Conway, CEC, *"following which Andy has asked what we expect him to do with them".*

(1) Do you have any comments on these matters?

CEC believed that tie should be doing all review, yet they repeatedly stepped in with rejections of usually incomplete design detail. As if it wasn't complex enough with tie's own apparent practice of "anyone can comment", the various organisational elements with in CEC were uncoordinated and produced a rising tide of rejective comments.

(2) To what extent had CEC been involved in the changes made to the process for the production and review of design?

Fully involved, but there seemed to be an agenda against 'we'll tell them clearly what we want' possibly because they believed that their powers had to remain unfettered, hence they could not be seen to 'lead' any design work. They seemed to believe that tie had been set up specifically to stop all problems arising.

11. In an e-mail dated 4 April 2007 (TIE00042722), Alex Joannides, TSS produced a (non-exhaustive) list of 14 reasons why the current detailed design packages had been considered sub-standard.
(1) What were your views, in general, on the matters in that e-mail?

Within engineering projects and life in general it is axiomatic that if producers see an army of checkers then they will take less care in accuracy. It was as if the entirety of the tie/CEC/TEL/TSS organisations felt that they had a bounden duty to review absolutely everything. Noone stopped this happening and so it is hardly surprising if SDS allowed their standards to slip, faced with the inevitability of constant rejection accompanied by a plethora of rejective detail.

(2) Did these matters cause you any concern in relation to (i) the quality of the detailed design packages being produced by SDS, (ii) the proposal whereby only a relatively small percentage of the designs would be reviewed by TIE/TSS and (iii) whether the design programme was realistic?

Yes. Repeated discussions with SDS revealed the ineffectiveness of the tie/CEC/TEL/TSS approach, but by the time David Crawley and I were engaged the die was firmly cast of behaviours, expectations and results. These were very hard to challenge because everyone seemed to believe that they had a right – duty even – to comment on everything, thereby contributing to the environment of confusion.

12. In an e-mail dated 4 May 2007 (CEC01625906), Ailsa McGregor noted her concerns that *"we are moving into construction phase of the Mudfa contract and we have still not resolved the gaps between the SDS and Mudfa contract, such as the sds design interfaces and scope of services,*

change control timescales, all of which are different in both contracts".

(1) What was your understanding of, and views on, these matters?

At the time of my engagement others had control of the tie/SDS matters involving MUDFA. There were so many such issues that had we diverted our attention away from the general route design issues we would never have resolved anything. A key part of the MUDFA design problem appeared to be the unreliable state of Utility as-built records.

(2) Did you share these concerns i.e. were there any "gaps" between the SDS and MUDFA contracts (and, if so, what problems did that cause)?

Yes, but as stated above, it would have been unwise to have been drawn into this vortex when so many other critical design issues and blocks existed to be resolved. In any case there were a multiplicity of people from all organisations involved already with MUDFA issues; to have further pitched in would have produced exactly the same kind of organisational and role confusion that unproductively pervaded the rest of the project.

13. By e-mails dated 11 April 2007 (CEC01623296) David Crawley discussed with Matthew Crosse that you would take over the SDS Project Manager role from Ailsa McGregor (who would be redeployed to the Commercial team, with responsibility for Project Controls).

See also your e-mail dated 13 April 2007 to Jason Chandler, PB (CEC01663582) noting that you had assumed the role of SDS Project Manager on behalf of TIE.

In that e-mail you proposed an agenda for the first of proposed regular meetings. The agenda included, *"2. Design Review process – discuss and agree: How to deal effectively with the existing 'deluge of disparate design deliverables'; the programme for self-assured packages ...; How to get best value from TSS".*

You also noted *"I am not certain that a sufficiently effective link exists with MUDFA such that at our meeting we will have an input so that we can reliably track their issues, if any, with design".*

(1) Did your role in TIE change around this time (and, if so, why and in what way)?

I cannot add further to the content and intent of the email. My words therein reflect the situation then, and support my recollections now.

(2) It would be helpful if you could explain your comment noted above in relation to the MUDFA design? How did TIE track MUDFA design at that time? Who within TIE was responsible for the MUDFA design? Did that fall within the responsibility of TIE's Engineering, Approvals and Assurance team?

Graham Barclay of tie managed the MUDFA processes. As noted in the email referred to with in this point 13 above, my role was to look at the output of those processes and assist with their progression if they affected progress within the general route design work. MUDFA was treated as a separate piece of work entirely, its eventual output being used to complete the

detailed design of the other route elements (track, structures, electrification, road layout etc).

14. By letter dated 28 February 2007 (CEC01800436) PB advised Ailsa McGregor, TIE, of their concerns that they were again being asked to consider a reprogramming exercise to re-align the deliverables for the utilities programme. PB further expressed concern that the period of 20 working days that had been allowed in the SDS programme for Statutory Utility Companies to respond was too short, that *"the utilities team at tie appear to be attempting to develop an early programme of utility diversion works for MUDFA, for early implementation (in road), in complete denial of the consequence of utility apparatus diversion designs that both our parties are developing and delivering being out of sequence with the development of the finalised roads and OLE design on which it should be based"* and that TIE's programme of utility diversion works had MUDFA executing works in the street before utility designers had an opportunity to undertake necessary re-designs in level and location of the apparatus diversions that will follow from necessary changes to track alignment and road layout and level and OLE pole location that would flow once Charette and DAP roads design issues were resolved.

Ms McGregor responded by letter dated 7 March 2007 (CEC01815617) in which she stated that *"The content of your letter appears to overlook the key issue, which is that the SDS Utility designs have been issued considerably later than planned, primarily due to design delays and slippages from Halcrow, your sub-consultant. The impact of these delays has generated a necessity to review the overall Mudfa programme, the prioritisation and the sequencing"*.

Alan Dolan, PB, responded by letter dated 17 April 2007 (PBH00003588).

(1) What were your views on the matters in these letters?

It was very obvious that the overall MUDFA processes were flawed. Any involvement I had was peripheral, based upon effects on other design elements, as previously outlined.

(2) To what extent did you consider, and address, the matters in these letters when you succeeded Ms McGregor as SDS Project Manager?

My prime role was that of managing the overall system design process. Others within tie were assigned to MUDFA management.

15. Slides for a power point presentation on 18 May 2007, Infraco Tender Evaluation (TIE00277961), showed (slide 17) that you were a member of the Infraco Technical Evaluation team, which team was led by Andy Steel of TSS/Scott Wilson.

(1) It would be helpful if, by way of overview, you could explain your involvement in that exercise? Do you have any comments on that exercise or the Infraco bids?

I was not involved at all in this activity.

(2) What was your continued involvement, if any, throughout 2007, in the consideration of the Infraco bids and/or in the procurement of the Infraco contract?

I was not involved at all in this activity.

16. By e-mail dated 7 June 2007 (CEC01629343) Jim McEwen, TIE, sent a note of a meeting on 4 June 2007 (CEC01629344) reviewing Procurement, Value Engineering, Resources and Risk (the meeting was attended by Geoff Gilbert, Stephen Bell, Jim McEwan and Stewart McGarrity).
The discussion in relation to Procurement, included:

- *"Take 2 months out of the programme through starting due diligence of the critical design items earlier, accepting that in doing this the design process will continue and specifications will therefore be subject to change. Underpinnnig this approach was a considered view from the Procurement team that the maturity of the design would have reached greater than pareto status by August and therefore that subsequent design changes would be modest and at any rate carry a < £10m aggregate impact ...".*
- *"The process for attaining the various approvals of the contract, once bidder selection was complete, shows over 3 months of elapsed time and has the net effect of taking the completion of the programme out to March 2008. The consensus was that this was too long and that we should aim to conclude by end of this Calender year".*

(1) Were these matters discussed with you?

I don't recall being involved in these particular discussions. I was involved in some VE meetings, chaired by Mr McEwan I believe, which were intended to find areas of possible VE.

(2) Do you have any comments on these matters?

To do VE after detailed design was well under way was not good practice.

17. The minutes of the meeting of the DPD Sub-Committee on 7 June 2007 (CEC01528966) noted (pages 6-7) that Steve Reynolds presented a paper on progress and critical issues in relation to the design.

Willie Gallagher is noted as having expressed his displeasure about the lack of progress and that he enquired why a programme had been presented together with assurances that it was achievable when it was known that the critical issues would prevent meeting the delivery dates. He also stressed that the current reporting format did not lend itself to identifying the real criticality of certain items (Mr Reynolds and Matthew Crosse are noted as having agreed that the report format was not providing complete information).

(1) What was your understanding of, and views on, these matters?

I have no knowledge of that. I was not involved in DPD.

(2) Were the concerns expressed by Mr Gallagher in respect of progress and reporting addressed (and, if so, how and when)?

We had already started processes for a more robust approach to the review of design. To have attempted to pull the levers of power in respect of inadequate progress was to misss entirely

the overriding fact that the project role and responsibility arrangements of tie/CEC/TEL/TSS/SDS were self-evidently confused and inadequate.

18. In an e-mail dated 13 June 2007 to Matthew Crosse (PBH00025580) Steve Reynolds set out his views on various matters including that much of the delay in design was due to delays in decision making by others, which fell outwith the remit of the SDS Design contract, and which meant that PB did not have the information they required to progress design.

(1) What were your views on that matter?

Mr Reynolds was right.

(2) Do you have any other comments on the matters in Mr Reynolds' e-mail?

I agree with his views.

19. An e-mail dated 21 June 2007 from Trudi Craggs (TIE00043716) noted a number of concerns in relation to version 16 of the design programme, including that the programme was not easy to understand, that it seemed there was very little logic or connection between these programmes which may add risk or delay to the programme and *"the time allocated to certain tasks is inconsistent, not in accordance with agreed protocols and does not in some cases reflect reality"*.
In another e-mail dated 21 June 2007 (TIE00043715) Ms Craggs noted that *"The way the prior approval process is being handled at present is frankly unacceptable from TIE's perspective. At present TIE has no confidence that the submissions will be right first time, that comments are being taken on board or that SDS can carry out the informal consultation process and update drawings to reflect comments within the agreed 8 week period"*.

(1) What were your views on these matters?

From the time of my involvement in this major project it was self-evident that the processes employed were ill thought out and were failing. In addition, the determination and allocation of organisational roles and responsibilities either was flawed or was not applied and followed. The mutual distrust led to mutual blame and little evidence of a concerted approach to working together as a team to resolve the problems. As the problems mounted and became more numerous, time and the will to do anything other than firefighting disappeared. The overall imperative was proceed to timescales sometimes seemingly regardless of common sense. Noone had the courage to stop, examine, discuss, resolve, agree a better way forward!

20. By e-mail dated 29 June 2007 (PBH00026295), Steve Reynolds advised that he was *"remobilising those areas of design activity which have been held"* and recorded certain concerns about continued attempts to optimise the design. He also noted that, *"should it be decided subsequently to revisit the design ... then this is a risk that TIE is taking"*.

(1) What were your views on the matters in Mr Reynolds' e-mail?

He was right; and David Crawley's clarification was practical and timely.

21. An e-mail dated 13 July 2007 from Matthew Crosse (CEC01626473) noted that MUDFA progress was to be added as a standing agenda item to the design critical issues meeting?

(1) Who within TIE was responsible for the utilities design around this time, including ensuring that the utilities design was of a required standard and was delivered on time? To what extent, if at all, did TIE's Engineering, Approvals and Assurance team have responsibility for these matters?

It was not the responsibility of the Engineering, Approvals and Assurance team to manage MUDFA activity.

22. Notes of a Design Review Meeting on 18 July 2007 (TIE00044271) stated that 18 packages of self-assured design was not now possible and that, instead, 63 sub-section batches would be provided (which would be reflected in re-issued version 17 of the design programme). The technical approval submissions were separate and would be shown on a separate schedule.

It was noted that the Tram Project Board had been told that a 1A DA package would be delivered by 11 July 2007, then later told August 2007 and that now it would not be until November 2007.
In an e-mail dated 19 July 2007 (CEC01675773) Andy Conway, CEC, stated that the notes of the meeting didn't reflect the Council's main point i.e. *"we were promised that the new design submission packages would include all relevant info ... in fact, the words used by SDS were that we would receive 'everything', plus a design assurance statement. This is not now the case, and I really don't see how CEC will be able to approve an incomplete design ... I'm also unclear how SDS can assure the design, knowing that it is incomplete"*.

You replied that *"We are where we are and have to move forward together. We have to find a way of progressively accepting design or ETN won't happen"* (see also Jason Chandler's response to Mr Conway on 19 July 2007, CEC01675827).

(1) Why was it not possible to produce 18 packages of self-assured design? Why was it decided, instead, to produce 63 batches?

The sheer volume of detail in a tram project! To produce a completely self-standing package of assured design based on 1/18th of the entire project, let alone the activity needed to review and accept it, proved to be unrealistic. In addition, it was unrealistic to expect a project to deliver even a single element of unequivocal design in an environment of organisational and specification unclarity, together with inadequate processes.

(2) Do you remember the cause of the delay in the package for section 1A?

Not in detail, but the problems would have been related to unresolved critical issues, MUDFA open issues, constant subjective 'interpretation' of requirements by CEC, TSS etc.

(3) What were your views on CEC's "main point", as noted by Mr Conway?

It was unrealistic, and based on a flawed assumption that Utility records were accurate, and that the overall project specification was complete, unequivocal and not reliant on subjective acceptance judgement.

(4) In general, how confident were you around that time that design would be produced in accordance with the design programme, and would be of the required quality?

The working and organisational environment at the time rendered it impossible.

23. In an e-mail dated 19 July 2007 (CEC01627050) David Crawley sought Mr Reynolds' views on whether the following actions would achieve a faster programme, namely, *"1. Move all Section 3 [i.e. Haymarket to Granton Square/phase 1b] work to the back of the programme. 2. Remove some or all of the structures from each Section's design deliverables package and consider them separately (and subsequent to the design assurance packages). 3. Double the number of design staff available"*.

(1) Was design work still being carried out on Section 3 (i.e. phase 1b) around that time and, if so why?

No one had given a clear directive otherwise.

(2) Were structures removed from the design deliverables packages and/or considered after the design deliverable packages? If so, did that result in the design for structures being less advanced as at November/December 2007 than it would otherwise have been? Did that, in turn, push back the programme for obtaining approvals and consents from CEC for such structures?

I don't recall.

24. The minutes of the meeting of the DPD Sub-Committee on 2 August 2007 (CEC01530449 at p7) noted that Mr Crawley had explained the concept of *"just in time"* delivery and the fact *"there is no margin for error"*.

The progress report presented to the meeting (PBH00027525 at p10) noted that there was only one remaining high level critical issue (Lindsay Road/Forth Ports) and one low level critical issue.
Version 17 of the design programme was available and was *"the first one that it has been possible to construct since the successful resolution of virtually all of the long-outstanding critical issues and RFIs"*.

"Each of the 18 design packages will be large and, in some cases, will follow each other in a very short space of time. To avoid review overload, it has further been agreed that the 18 packages will be sub-divided into more digestible sub-packages which match the "Prior Approval" and "Technical Approval" milestones. Each of those sub-packages will be accompanied by as much associated design assurance information as is possible. This means that when the 18 final design assurance packs are submitted for review, the workload will be manageable".

The dates for completion of design for different Sections ranged between 26 February and 24 June 2008 (p19).

A table (p21) showed due diligence of critical design items by 19 November 2007 and due diligence

of non-critical design items by 17 December 2007, with financial close on 28 January 2008.

(1) Did the process for producing, reviewing and agreeing design change again around this time (and, if so, in what way and why)?

I don't recall in detail

(2) What was your view at that time as to whether v17 of the design programme was realistic and achievable?

It was highly risky

(3) What was your view at the time as to whether it was reasonable to base the design (and procurement) programme on design being produced "just in time" with "no margin for error"?

It was exceptionally risky. At that point – indeed at others before - the ship should have been hove to in order to get resources and processes in order and for a practical course to be charted. But senior management seemed intent on maintaining course regardless, probably because they absented themselves from the real action and appeared to manage by meeting and email.

25. The minutes of the meeting of the DPD Sub-Committee on 2 August 2007 (CEC01530449 at p10) noted that that v17 of the design programme would be slightly revised to give structural design elements a lower priority than other design elements (which was noted to facilitate their earlier completion, with consequent improvements in the overall review process).

(1) Why was it decided around this time to give structural design elements a lower priority than other elements? Was that related in any way to the need to speed up the programme and/or a decision taken around that time to carry out a Value Engineering exercise in relation to structures?

I don't recall.

26. An e-mail dated 2 August 2007 by Andy Steel, TSS (CEC01551796) noted certain high-level concerns in relation to the proposed Detailed Design Review process.
Mr Steel noted, *"We now know that the design will not be coming in packages but will be drip-fed as it becomes available. That brings its own problems ... this process will only work if SDS are made to produce a detailed flow of information which in terms of regular rate of delivery is acceptable to TIE and can be resourced. Any plan that I have seen in recent weeks has the apparent shelf life of a chocolate fireguard ... We discussed at the meeting the need to categorise the information flow into what is critical (itself to be defined but will mean different things to different stakeholders) and what can have a lower scrutiny level. That process needs to be done now and then incorporated into the detail review process at the very beginning. Take the above approach and we may have the possibility of staying within the cost aspirations of our Project Director. At the moment it is an open-ended cheque. TSS cannot commit to being a part of that".*

(1) What were your views on the matters in Mr Steel's e-mail?

He was not wrong, but what was needed was realism from the top. This was absent.

(2) Were Mr Steel's concerns addressed and, if so, how?

His concerns were symptoms of the organisational and procedural malaise which went unrecognised and untreated throughout the project.

(3) Did this represent another change in the process for producing, reviewing and agreeing design (and, if so, what were the main changes)?

I don't recall

27. An e-mail dated 8 August 2007 from Jim McEwan (CEC01632109) noted that you had recently expressed the view that the Value Engineering register (CEC01632111) *"was not reflective or consistent with the true position on Structures"* (and that Willie Gallagher had expressed his concern that the proposed savings in structures were *"Not enough"*).

See also (i) your e-mail dated 14 August 2007 (TIE00040756) providing a "quick and crude" breakdown of the possible VE savings on structures walkways and (ii) Mr McEwan's further e-mail dated 26 September 2007 (CEC01598234) with an updated version of the VE register (CEC01598235).

(1) It would be helpful if you could explain your views on these matters?

To have decided to do VE in an already chaotic project was ill-advised. It diverted attention from matters of real importance and should have been priority 10, not priority 1. It demonstrates a detachment from reality.

(2) More generally, what were your views as to whether the value engineering savings sought were likely to be achieved? (see, in that regard, a presentation on Value Engineering by Mr McEwan to the Tram Project Board in late October/early November 2007, TIE00037086).

Nothing further to add. Any possible savings would have been counterbalanced ten fold by the chaos elsewhere.

(3) In the event, were these value engineering savings achieved (and, if not, why not)?

I don't recall.

28. Mr Crawley's progress report for the TPB on 9 August 2007 (CEC01565001, p35, para 4.0) noted, *"The 18 fully self-consistent packages will be delivered rather late to meet procurement milestones for Infraco pricing purposes so it has been agreed that key elements of them will be supplied earlier to the Infracos to facilitate the best possible pricing certainty from them"*.

(1) What were your views on whether that proposal (i.e. supplying key elements of the design to the Infraco bidders at an earlier stage) was realistic and achievable?

In theory it should have helped. In the event, the uncertainty therein might have led the Infraco to adopt a contractually combative and risk-adjusted position.

(2) What were the key elements of the design that were to be supplied earlier?

I was not involved with that determination.

(3) What was your understanding as to when the remaining design was to be supplied to the Infraco bidders?

I have no knowledge of that.

(4) What was your understanding as to how Infraco bidders could produce a fixed price before all design had been completed and all statutory approvals and consents had been obtained?

I was not involved with that determination and my views were not sought.

(5) Was the proposal noted above discussed, and agreed with, (i) the Infraco bidders and (ii) CEC?

I was not involved with that determination and my views were not sought.

29. An e-mail dated 13 August 2007 from Graeme Walker, TSS (CEC01681911), re SDS surveys, expressed concern that *"the information that has been produced by SDS relating to surveys and investigations is deficient in the information necessary for AMIS to undertake the works"* (including, for example, in section 1B, no survey or investigation of the Leith Walk railway bridge structure relating to the MUDFA works had been undertaken).

(see also (i) an e-mail dated 28 March 2007 by Ray Dent, TIE, to Graeme Barclay, Utilities Director, TIE (CEC01638353), noting a number of concerns in relation to SDS, including that there appeared to be an SDS tactic of avoiding doing works now and accepting that it will have to be done later where they expect to be paid e.g. *"SDS were going to do hundreds of trial pits, then proposed tens of trial pits, then 3, and now zero"* and (ii) an e-mail dated 3 December 2007 from Sandra Cassels, DLA (CEC01540976), which noted that there was a disagreement between TIE and SDS in relation to the surveys SDS required to carry out under the SDS contract, it being noted that *"Tie are of the opinion that SDS were obliged to carry out certain types of survey far greater in scope than SDS actually carried out, whereas SDS are of the opinion that they have fulfilled their obligations under the SDS Agreement"*).

(1) What was your awareness of, and views on, these matters?

I was not involved in this detail of the MUDFA works.

(2) What were your views, in general, on whether sufficient surveys and investigations had been carried out, sufficiently early in the programme, to inform the utility design and utility construction works?

I was not involved in this detail of the MUDFA works.

(3) What were your views on whether sufficient surveys were carried out, sufficiently early in the programme, to inform the civil engineering (i.e. non-utility) design and works?

I was not aware of deficiencies that could have affected such design.

30. On 30 August 2007, a report to CEC's Internal Planning Group (CEC01566861) noted (page 6), under Detailed Design Technical Review Process, *"This will become a significant work stream for CEC and will be very labour intensive. It is anticipated that this will involve reviewing potentially as many as 16,000 drawings and 600 reports. It is critical that this will commence in early September, however TIE have still to confirm this"* (at para 2.3).

It was further noted (page 11, para 6.3), under Planning Prior Approvals, *"A revised Prior Approvals programme has now been prepared by TIE/SDS. This would extend until June 2008 ..."*..

(1) Did the number of drawings and reports noted above that would require to be reviewed by CEC accord with your general understanding?

If CEC's approach was to review in detail the entirety of the SDS design output then that was unrealistic and would have given SDS the clear message that they didn't need to check their work thoroughly because others downstream would do so. An inadequate specification, compounded by an ill-thought out process tied up key resource in review work rather than the very problem solving that would have assured a more complete and higher quality SDS output.

(2) Did the review that would require to be carried out by CEC cause you any concerns as to whether the SDS design programme was realistic?

Another good example of flawed thinking in respect of processes, use of critical expert resource and organisational and procedural unclarity.

31. By e-mail dated 13 September 2007 (TIE00041688) Gavin Murray advised that *"I fear we are not just back where we were last December but back from where we started"*, before setting out concerns that had arisen following a conversation with Andy Conway, CEC to the effect that CEC, as statutory authority, were likely to require considerably more information than had been received. Mr Murray also expressd concerns that only 10% of design was to be reviewed and that design was not being provided as a complete assured package.

(1) What was your understanding of, and views on, these matters?

His fears were not unjustified, especially in the light of the flawed thinking in respect of processes, use of critical expert resource and organisational and procedural unclarity.

(2) In an e-mail dated 19 September 2007 (TIE00040871) you provided wording for the executive summary of a report to Transport Scotland and the Tram Project Board. Do you consider that your suggested wording on the Design Review Process adequately reflected the concerns of CEC, as expressed by Mr Conway to Mr Murray?

My words refelected what should have been possible.

32. By e-mail dated 25 September 2007 [CEC01682898], Susan Clark attached TIE's Design Management Plan (CEC01682900).

(1) What was the purpose of the Design Management Plan? Was it followed? Do you have any further comments on the Design Management Plan?

It described how SDS design was handled through the acceptance process. It was an all too rare example of a properly thought-through process, which other parts of tie could have used as an exemplar but didn't..

33. A report to CEC's IPG on 27 September 2007 (CEC01561544) noted:

Detailed Design Review Process, *"Initial meetings were held on the 7th and 13th September to discuss and agree the review process, which is being split into two separate areas; Planning and Policy related or Technical. A trial submission highlighted some serious gaps in the quality of information being brought forward at this stage. CEC have emphasised that this needs to be resolved as a matter of urgency ..."* (para 3.3).

Planning Prior Approvals, *"A revised Prior Approvals programme was tabled by TIE on 6th September. This differs to the previously agreed programme which extended until the end June (as outlined in the previous Report) in that a significant proportion of the Prior Approval determination dates have been brought forward to the end December/end January. This reflects the need to have Prior Approvals in place in advance of the letting of the INFRACO contract"* (para 7.6).

(1) What were your views on the comment noted above in relation to *"serious gaps in the quality of information being brought forward"*?

My previous answers apply.

(2) It appears that a revised Prior Approvals programme was tabled which brought forward a significant proportion of Prior Approval dates to the end of December/end January. What were your views at the time in relation to whether the revised Prior Approvals programme was realistic?

I don't recall.

34. E-mails dated 10 October 2007 noted an increase in the number of design deliverables from 284 to 325 (TIE00038607).

(1) As noted above, it had previously been variously agreed that 40, 18/19 and then 63, self assured design packages would be produced. Why did the number of self-assured design packages change so much?

Principally driven by the mutual desire to get at least some packages of design completed and therefore able to be reviewed and accepted. The reason for the changing number was driven by the view through time of the quantum of such packages.

(2) Did that cause you any concerns?

The aim always was to get as much completed as possible and, in effect, to ring-fence those geographical areas that were proving hard to pin down. So it was a laudable aim.

35. An e-mail dated 11 October 2007 (TIE00036979) noted that Damian Sharp was to join TIE.

(1) It would be helpful if you could explain why Mr Sharp joined TIE, what was his role and whether your role changed in any way around that time?

I don't know why he was engaged. He relieved me from the SDS Project Management role, but in so doing, created another new interface to be managed.

36. We understand that John Dolan, Interfleet Technology Ltd, was the Independent Competent Person for the tram project under the Railways and Other Guided Transport Safety Regulations 2006 (ROGS).

In an e-mail dated 12 October 2007 (TIE00036906), Mr Dolan noted concerns arising from his observation of design reviews and his on-going sampling of design specifications.

Mr Dolan noted, *"If tie's consultants persist in preparing designs for stakeholder approval that do not clearly address integration across team boundaries, or recognisably take account of Operations and Maintenance matters, tie must understand that there is a risk that, once designs are properly integrated and due cognisance is taken of Operations and Maintenance, the original design may have been significantly revised, possibly involving the need to revisit stakeholder approval"*.

(1) What were your views on Mr Dolan's concerns as noted above?

His view appeared understandable.

(2) In the event, did the original design require to be revised and was there a need to revisit stakeholder approval?

My previous answers apply.

37. An e-mail dated 7 November 2007 from Jim McEwan (TIE00037085) noted that *"The BBS bid price is generally based on designs which were current in March of this year, designs which may well have evolved since with SDS and may also have gone through some formal or informal approval"*.

(1) Given the state of design in March 2007 (including the number of critical issues that were outstanding), what were your views on whether BBS's bid price was likely to change (including whether the price was likely to increase or decrease) in light of design development since March?

It was likely, although one could possibly argue that their approach to risk could have covered this.

38. There appear to have been difficulties in November 2007 in design document control and in relation to TIE, CEC and BBS accessing design documents and drawings.

By e-mails dated 5 November 2007 (TIE00038114), for example, Mr Crawley advised Jason Chandler of problems in relation to TIE (and CEC's) access to design documents and drawings.
In an e-mail dated 8 November 2007 (PBH00031070) you attached a new document control process (PBH00031071).

You sent an e-mail on 16 November 2007 to Steve Reynolds, entitled "Frustration Central" (PBH00031265).

See also an internal PB e-mail thread dated 8-16 November 2007 in relation to these matters (PBH00031284).

In an e-mail dated 17 November 2007 (PBH00031360), Scott Ney, PB, noted that *"Tie have no procedure in place with us for this process, nor any form of document control (visible to us) with their preferred bidder and are trying to place this burden and any blame arising upon ourselves"*.
TIE/PB e-mails dated 28/29 November 2007 (PBH00032057) noted BBS as having reported concerns in relation to not receiving sufficient design information in relation to structures to enable them to produce a firm price.

(1) What was your understanding of these problems, including why they had arisen and the difficulties they created?

I don't specifically recall this.

(2) Were these problems resolved (and, if so, how and when)?

I don't specifically recall this.

39. The report to CEC's IPG on 15 November 2007 (CEC01398241) noted (para 3.3):

Detailed Design Review Process, *"Reviews of the individual disciplines of the detailed design continue. The packages have yet to be coordinated by the designers therefore the value of these reviews is limited and all packages will require resubmission when complete and fully coordinated by the designers and TIE. Further delays to the design programme are becoming apparent with all technical reviews programmed to complete after financial close. CEC have emphasised that this needs to be resolved as a matter of urgency ... The latest programme, V21 is still not approved by CEC and consultation is required between CEC, TIE, SDS and BBS before an approved programme can be produced"*.

(1) Do you have any comments on the matters noted above?

This is an example of the approach adopted to design approval/verification/checking/acceptance. It was evident that CEC appeared to expect the following levels of 'check' to be applied:

- *SDS designer checks own work and also to inter-disciplinary content (IDC)*
- *SDS checker checks and verifies, including IDC*
- *TSS 'check' including IDC*
- *tie Engineering group review selected areas of selected 'batches' for acceptability of design verification and risk mitigation evidence*
- *CEC 'check' to unspecified criteria*

In any case, had specification been unequivocal, Utility records correct and organisational confusion minimised, design would have been much more likely to have been correct at first offering.

40. An e-mail dated 21 November 2007 from Carla Jones, PB (PBH00014489) attached a weekly deliverables tracker (PBH00014490) and noted that (out of a total of 344 design deliverables), 283 had been planned for delivery by that date and 227 had been delivered.
Of the 52 late deliverables, 32 had been delayed for reasons such as Forth Ports (Lindsey Road alignment/ADM Milling etc), EARL related changes, SRU, Network Rail approval of Balgreen Road Bridge, Bernard Street, Casino Car Park, Leith Walk Substation, Cathedral Substation, St Andrew Square and Ocean Drive Bridges.

20 deliverables were late for reasons totally in SDS control.

Internal PB e-mails dated 21 November 2007 (PBH00014500), entitled "Critical Issues – 'flat line on deliverables', noted a recent assertion by Mr Crawley of "1000 days" of cumulative delay and a reference to ongoing issues in relation to Forth Ports, SRU, Picardy Place, Edinburgh Park Viaduct and St Andrew Square.

An e-mail dated 22 November 2007 from Damian Sharp (CEC01481844) noted a further 1314 days of delay between 9 and 16 November 2007 (on top of 1299 days between 26 October and 2 November 2007) and stated *"Without the percentage complete column being updated it is impossible to draw any real conclusions about the health of the deliverables programme. It is certainly clear that on 2 November SDS did not bring out all their dead"*. The main areas of slippage were tram stops, structures and sub stations (Mr Sharp attached a version of PB's weekly tracker with his own mark up, CEC01481845).

An e-mail dated 22 November 2007 from Damian Sharp (CEC01481849) noted that some prior approvals were due to start later than the construction programme required and the technical approvals programme still showed too much activity in February – May 2008, and was out of synch with the construction programme (see also Mr Sharp's e-mail dated 6 December 2007, CEC01482817).

An e-mail dated 26 November 2007 from Mr Crawley (PBH00031752) set out a number of concerns in relation to the programme for prior approvals, the programme for technical approvals, the programme for consents, the design deliverables tracker and progress reporting and management

reporting. Mr Crawley attached an e-mail dated 26 November 2007 (PBH00031753) from Tom Hickman, Programme Manager, TIE, which attached a list of SDS Issue for Construction dates from version 22 of the design programme where the IFC date was either after the Infraco programmed construction start date or close to it (PBH00031754).

An e-mail dated 5 December 2007 from Mr Hickman (CEC01493998) noted that there had been a slippage of approximately 20,000 deliverable days over a 140 day window between 2 July and 19 November 2007 (the attachment is CEC01493999).

An e-mail dated 19 December 2007 from Damian Sharp (CEC01483413) noted that *"there is now some hard evidence that historical delay is being out behind us and there isn't new delay being shown on the tracker"*.

(1) Do you have any general comments on the matters noted above?

In a welter of detail the essential underlying causes of problems often lie buried out of sight. The majority of the tie/CEC organisations seemed always to be pre-occupied with monitoring numbers rather than what actually was happening and proactively and collaboratively tackling the causes of why some of it wasn't happening.

(2) Given the slippage noted in the above documents, what were your views in late 2007 on whether the design programme would be met? What were your views around that time on when the detailed design would be completes (and all statutory approvals and consents would be obtained)?

It was unlikely to happen without significant project cultural change and organisational clarity. The Titanic 'deck chair' metaphor springs to mind . . .

41. In an e-mail dated 20 November 2007 to Matthew Crosse (PBH00031415), Steve Reynolds noted *"the potential change to Employer Requirements"*.

In an e-mail dated 3 December 2007 (CEC01480075), Andy Steel, TSS, expressed the opinion that it was a *"practical impossibility"* that the Infraco Employer's Requirements, Infraco Proposals, Tram Vehicle Employer's Requirements, Tramco Proposals and SDS Design would align with each other at novation.

An e-mail dated 4 December 2007 (TIE00039468) from Geoff Gilbert to Richard Walker, BBS, set out a proposal to align the SDS Design, Infraco Proposals and Employer's Requirements.

In an e-mail dated 24 December 2007 (TIE00039586), Jim Harries, Transdev, expressed the opinion that there was a need for proper direction from TIE on how to address SDS's design and that, without that direction, there was a risk of *"Generating confusion and the consequential potential for future "Changes" with both SDS and BBS"*.

(1) We understand that concerns in relation to the Employer's Requirements were expressed on a number of occasions in 2007 (see e.g. e-mail dated 26 April 2007 from Martin Donohoe, TSS, in which he noted, *"To be blunt – it urgently requires some work!"*, CEC01601660). When did you

first appreciate that there was a misalignment between the SDS Design, the Employer's Requirements and BBS's offer?

This had been the case from the outset, but was ignored for reasons unknown to me.

(2) It would be helpful if, by way of overview, you could explain the problem, how it had arisen, the risks that arose, the steps taken to try and address the misalignment and whether these steps were successful?

It is inevitable that in any complex major project there will be a multiplicy of requirements. The fatal flaws were to proceed before these were established and to fail to have in place a culture and process which accepts that requirement/specification change are inevitable, but has practical and effective processes to deal with such changes.

42. By e-mail dated 30 November 2007 (CEC01500320) you advised Steven Bell that:

"... 2. There is widespread unclarity as to who does what in tie. I have issued a list ... of who does what in my team to help bring clarity to others. I need the same from the other teams in tie. The unclarity is manifest in every issue being dabbled with, often to no conclusion, and always to confusion by multiple people who do not communicate with each other and further complicate what should be more simply solved by a focused discussion between the right people who make decisions and communicate the results.

3. It has come to light that tie's Procurement team has been receiving documents direct from SDS which are not lodged within tie's document control system. The result is that I and my team, and doubtless others, are working on duff gen and making duff decisions. This is incredible".

See also an e-mail dated 4 September 2007 from Gavin Murray, TIE (TIE00041624), in which Mr Murray expressed concerns in relation to the design team *"being frustrated by other elements of TIE getting involved to the detriment to the progress of the design".*

(1) What were the issues, how had they arisen and what problems did they cause?

I cannot add to the words that I and Gavin quoted, which expressed clearly not only our frustrations but also some positive suggestions for improvement elsewhere. They were unheeded. They arose because of the organisational problems within tie that were never effectively addressed.

(2) Were these matters ever addressed to your satisfaction (and, if so, when and how)?

No.

43. The minutes of the Tram Project Board on 7 December 2007 (CEC01526422 at para 3.2) noted Steven Bell as highlighting, *"Slow design delivery requires prioritisation within key streams to help BBS programme".*

The progress report presented to the meeting (CEC01387400) noted: *"To 23rd November, of the 344*

design deliverables, 236 have been delivered, representing 63% of the tram system design. 66% of Phase 1A detailed design is now complete and it is expected that about 75% will be complete by the date of placement of the construction contract in Jan 2008 ... SDS design process will be discussed with Tom O'Neill, the PB President, on the 5th December" (para 1.2.3).

(1) Does that accord with your general recollection of matters around that time?

The delayed design was not primarily because of the inadequacy of SDS resource. It was because of the failures previously noted.

(2) Do you have any further comments?

No

44. A report presented to CEC's IPG on 11 December 2007 (CEC01398245) noted:

Detailed Design, *"Further delays to the design programme are becoming apparent with all technical reviews programmed to complete after financial close. CEC have emphasised that this needs to be resolved as a matter of urgency"* (para 4.2).
It was noted under Planning Prior Approvals: 1 planning permission and 5 prior approvals had been granted, 4 prior approvals were currently under consideration and 52 batches remained to be submitted for prior approval.

"Of the batches received, a number have been put on hold awaiting revised details from the designers. There is concern that prior approvals may have to be revisited if there are substantial changes in design coming from inter-disciplinary coordination, technical approvals or value engineering" (para 4.2).

(1) Again, does that accord with your general recollection of matters around that time?

Yes

(2) Do you have any further comments?

No

45. By e-mail dated 14 December 2007 [CEC01397774] Duncan Fraser, CEC, referred to a presentation by TIE the previous day and asked certain questions about the Quantified Risk Allowance, including querying the provision made for the likely change in scope given the incomplete/outstanding design, approvals and consents.

Mr Fraser stated, *"The scope of the works is not clear to CEC and specifically the quality and quantity and status of designs on which BBS have based their price. Also none of the designs are approved (none technically and only 4 out of 61 prior approval packages) hence the scope is likely to change, hence provision should be made for this".*

Geoff Gilbert replied, *"I have previously explained the interrelationhip between emerging detail*

design, Employer's Requirements and Infraco Proposals works and how price certainty is obtained out of this process and are in the process of delivering such certainty. Therefore, please advise what scope changes you anticipate arising out of the prior approvals and technical approvals. The overall scope of the scheme is surely now fixed, is it not?".

(1) What were your views, at that time, on the above matters including, in particular, whether the "scope" was fixed or whether there was a material risk that the scope would change?

This appears to reflect the gulf between what some people wished to believe and the chaotic reality. There always seemed to me to be a significant gulf between the so-called "Commercial" people and those of us charged with delivering the project. From my viewpoint, their ever-increasing numbers achieved nothing except to add fuel to the fire of confusion.

2008

January to May

46. An e-mail dated 10 January 2008 from Eric Smith (TIE00693762) expressed scepticism about the Infraco procurement programme and noted, *"In any event, Tony Glazebrook hasn't even worked out what documentation is required yet, other than saying he thinks that the onus should be on BBS to confirm compliance"*. Mr Smith also referred to *"BBS's dismal record with me and their lack of ability to communicate"*.

(1) What was your understandin of, and views on, these matters?

I vividly recall the dialogue with this person. He had absolutely no grasp of what comprises a major infrastructure project and the content and deliverables therein. I had explained to him how the design and acceptance process worked – which he presumably did not understand - but, for his own reasons, he chose to adopt the stance within the email referred to here. This is a graphic example of the sniping and misinformation that grew ever larger in this project between those that understood engineering projects and those who did not.

47. An e-mail dated 23 January 2008 from Damian Sharp (PBH00016028) attached a document listing all of the things that were currently holding up the Interdisciplinary Design Checkj (IDC), Prior Approvals and/or Technical Approvals (PBH00016029).

(1) We note that the above document noted you as responsible for only one issue, regarding Network Rail. It would be helpful if you could explain your role, duties and responsibilities from around this time up to Infraco contract close in May 2008?

I have no recollection of this particular issue (fuel offloading for pollution prevention).
My role originally was that of directing (with David Crawley) the Engineering Acceptance process. It was enlarged to include SDS project Management (omitting SDS' MUDFA activity which was directed by tie's Graeme Barclay) and also to include some liaison work with Network Rail over interfacing engineering matters and bridge etc agreements. When Mr Sharp transferred from Transport Scotland to tie he took over the SDS Project Management role. I

don't recall the timing in detail.

48. The minutes of a joint meeting of the TPB and the TEL Board on 13 February 2008 (CEC01246825 at para 4.3) noted:

CEC Technical and Prior Approvals, *"Steven Bell ... confirmed that the final design packages are now expected in late 2008 and that the critical designs will be identified and dealt with in the programme"*.

Price, Budget and Risk, *"[Stewart McGarrity] explained that the to-go costs in the budget represented the full programme and scope of works, with a risk allowance of approx £30m relating to £90m of non-firm future costs. However, the budget does not contain allowances for stakeholder changes to programme or scope"* (para 6.1).

"It was stressed that the Infraco price was a negotiated number, which included a premium for achieving price certainty on previously provisional items, as well as some contingency for design issues" (para 6.2)

(1) What was your understanding of, and views on, these matters?

It would have been remarkable to expect price certainty when design was unfinished and approvals and acceptance not completed. In any case, it is my understanding that the root cause of the Infraco cost escalation was that the bespoke Infraco contract drawn up at great cost for tie was flawed fundamentally in that it allowed the Infraco to claim that everything needed to be changed and that those changes would be an on-cost; which is exactly what transpired once their contract was under way.

(2) If final design packages were not expected until late 2008, what was your understanding in relation to how BBS could undertake due diligence on the design and provide a fixed price?

I have no idea. At the time I was astonished to hear this.

(3) What was your understanding in relation to whether changes to programme or scope were likely post Infraco financial close/SDS novation?

Whatever the Board thought, it was absolutely inevitable that changes would occur. It could hardly have been otherwise when the design was incomplete and in virtually constant flux due to the ineffective organisational arrangements?

49. On 18 February 2008 Bilfinger Berger produced a Design Due Diligence Summary Report, based on design information received by BBS by 14 December 2007 (DLA00006338). That document raised various concerns about design, including that *"more than 40% of the detailed design information"* had not been issued to BBS.

(1) Did you see, or were you otherwise aware of, BBS's report?

I have no recollection of this, but would have been unsurprised at such a remark.

(2) To what extent do you agree with the matters in the Executive Summary of the report, including the assertion that approximately 40% of detailed design was outstanding (or, at least, had not been issued to BBS)?

I have no recollection of this, but would have been unsurprised at such a remark.

50. An e-mail dated 19 February 2008 from Andy Steel, TSS (CEC01424691), in relation to design review, noted that *"The original concept was that the initial packages would be reviewed in detail. Only if tie were satisfied with the quality of the deliverables would the review be reduced to a sample. The sample would in principle amount to 10% of the total delivered to tie. As an output check a later package was also to be reviewed in detail to ensure that there had been no back-sliding etc. In practice this approach has never been practical because of the repeated failure of SDS to deliver even one complete package (it is now 9 months since they submitted the 'exemplar' package!). Further whilst the Thursday sessions have been useful the quality of what has been submitted has been at best variable. In any statistical sense in my opinion this would not give the required level of confidence to accept the remaining 90% unreviewed. I doubt our council friends would even go that far!"*.

(1) What were your views on the matters noted above?

The principle was correct. The situation referred to resulted from the organisational ineffectiveness of the tie/CEC/TSS/TEL arrangements.

(2) Had the design that had been completed by this time been properly reviewed? Was it ever properly reviewed?

Much design was reviewed. In engineering terms much was was acceptable. The principal causes of rejection arose from CEC who claimed that it was not to standard, didn't meet planning 'requirements' (the latter seemingly driven by subjective, not traceably objective, judgement), conflicted with street features etc etc. Effective specification and teamwork would have prevented this situation arising.

51. A progress report provided to the TPB on 12 March 2008 (CEC01246825) noted:
"SDS submissions to CEC for their approvals are now timed such that, in some cases, construction is programmed to commence before approval has been completed" (p12).

"Design. The delivery of design to meet the construction schedules for various structures is causing concern and detailed reviews and discussions are underway with SDS, CEC and BBS to provide solutions" (p19).

(1) What was your understanding of, and views on, these matters?

I recall the issue but not the detail. It would have been reasonable to expect that the Board would have been a) aware of this and b) wold have initiated effective action to locate the cause and adjust the processes and timescales so as to produce a predictable result.

(2) To what extent, if at all, were the problems with the delivery of design for structures noted above related to the decision in 2007 to give structures a lower priority in the design programme?

I don't recall the detail but I think that the structures designs themselves were not problematic in strictly structural terms. It is more likely that delays in approval arose from peripheral perceived concerns around eg drainage outlets, design of access routes, bridge agreements with Network Rail (whose legal team triumphed in endless prevarication and constantly piling on wording change on change) etc.

52. By e-mail dated 26 March 2008 (CEC01493121) you advised that the sole item to be discussed at a forthcoming meeting with BBS on 2 April 2008 in elation to Design Construction was *"Jointly to answer the question: how will BBS construct where design has not yet been design-assured by SDS?"*.

An e-mail dated 28 March 2008 from Ralf Honeck, BBS (in the same e-mail chain) noted that BBS proposed splitting the 13 geographical packages for phases 1a and 1b into smaller packages, the purpose of the package split being to allow construction start date of certain construction elements without having a completely approved design for a whole geographical section.

Mr Honeck further noted, *"We confirm again that BBS will not start construction without having a design approved by relevant authorities and issued for construction"*.

In an e-mail dated 28 March 2008 (CEC01493120) you sought guidance from Mr Bell and noted that you had not been a party to recent discussions with BBS in relation to SDS novation and were *"left with the feeling that BBS has some undeclared agenda within their stance on this issue"*.

(1) What are your comments on these matters? What did you understand BBS's undeclared agenda to be? What was your understanding as to how matters were resolved?

It is self-evident that to start construction with incomplete design is unwise. An effective Infraco contract would have provided for this. Effective teamwork would have smoothed this turbulence. The absence of these factors allowed the Infraco to claim endlessly for changes. The disconnect between the commercial and engineering teams, together with further escalating role unclarity and ad hoc and on the hoof staffing and organisational changes further contributed to the fires of confusion and cost escalation.

53. Mr Reynolds' Weekly Report for PB dated 28 March 2008 (PBH00036973, para 1.1) noted that *"it remains the case that tie has a price on the table which assumes approximately £12m of value engineering improvements will be delivered and a construction programme which does not reflect the design effort required to deliver those improvements. Tie appears comfortable with this state of affairs and has suggested that changes will be instructed on day one of the Infraco contract to address the imbalance. I do not believe the major stakeholders, including CEC are aware of the position and we must ensure that the Novation Agreement is worded such that it protects PB from any accusations of deception which could be levelled at tie in future"*.

(1) What were your views on these matters?

Mr Reynolds was right.

54. On 31 March 2008, David Leslie, Development Management Manager, Planning, CEC, sent a letter to Willie Gallagher (CEC01493318) which noted: **31 March should be 28 March**

"It is extremely disappointing that TIE, as the Council's agent, has been unable to ensure that SDS have completed all the prior approvals prior to the bidding process, and that there still seems to be no effective control over the constantly-slipping timetable for Prior Approval submissions. This could create difficulties in the coming months where BBS have been forced to make assumptions in their bid which do not correlate with our own expectations ... It is ... of concern that the quality of so many submissions, despite a quality assurance checking system supposedly in place by TIE/SDS, remains very unsatisfactory, requiring extensive revisions or resubmissions as appropriate". (you, and others, appear to have been forwarded this letter by Willie Gallagher, CEC01493317).

On 3 April 2008 Duncan Fraser sent a letter to Willie Gallagher setting out similar concerns by the Transport Department relating to Technical Approvals and Quality Control Issues (CEC01493639).

(1) What was your understanding of, and views on, the matters in these letters?

Despite ample and clear evidence, the Board consistently chose for whatever reason to maintain course despite that course heading straight for the rocks. Direction and management by meetings and emails alone is ineffective.

(2) What was your understanding of the difficulties that could arise post financial close *"where BBS have been forced to make assumptions in their bid which do not correlate with [CEC's] expectations"* and if *"extensive revisions or resubmissions"* were required?

Self-evidently it was a flawed course of action.

55. On 16 April 2008 a report to CEC's IPG (CEC01246992) noted:
Planning Prior Approvals: 1 planning permission and 18 prior approvals had been granted and 40 batches remained to be submitted for formal Prior Approval (26 out of the 40 batches were under informal consultation).

"There is concern that prior approvals may have to be revisited if there are substantial changes in design coming from inter-disciplinary coordination, technical approvals or value engineering. Planning has written to TIE on 28 March 2008 raising their concerns" (para 6).

Technical Approvals: (para 6), to date no roads technical approvals had been obtained, *"there has been significant slippage"* and, similar to the concerns raised by Planning, Transport had also written to TIE on 3 April 2008 *"reiterating their concerns about the quality of the submissions being received".*

"There is potential for the approvals to cause a delay to the construction programme" (original emphasis).

A table indicated that roads approvals were expected to be obtained between February and October 2008. It was unlikely that the appropriate Planning Prior Approvals would be obtained prior to the commencement of construction works for three locations (Russell Road Bridge, Haymarket Tramstop and the Depot at Gogar). These three locations were on the critical path for the tram delivery.

(1) What was your understanding of, and views on, these matters?

This was hardly surprising. For all of the reasons already included in my answers, this result was inevitable.

56. Financial close of the Infraco contract (CEC00036952) and novation of the SDS contract to BSC (CEC01370880) took place on 14 and 15 May 2008.

(1) What was your general understanding at that time of the extent to which design was incomplete and/or that completed design was liable to change?

I don't recall the detail – whose status will be within the SDS programmes issued at that time. But again, any informed person would have foreseen the problems that would arise in proceeding headlong with incomplete design.

(2) There is a suggestion that the sum of £1m was paid to PB as an incentive to novate the SDS contract. Is that correct and, if so, why was that sum (i) sought and (ii) paid, given that PB were required under the SDS contract to agree to novation?

I have no knowledge of this.

(3) What was your general understanding of the agreement reached between BBS and TIE on which party bore the risks and liabilities arising from incomplete design, the outstanding statutory approvals and consents and the misalignment between the SDS Design, the BBS Offer and the Employer's Requirements?

I have no knowledge of this.

(4) To what extent, if at all, did the TIE team negotiating the Infraco contract and price discuss these matters with you (or with others in TIE's Engineering and design team)?

They did not.

57. The Infraco contract included a Pricing Schedule (Schedule 4) (USB00000032).

(1) Did you see, or were you otherwise made aware of, Schedule 4 and the various Pricing Assumptions it contained?

No

(2) Pricing Assumption 1 in section 3.4 dealt with design. Did you see, or were you otherwise made aware of, that Pricing Assumption?

No

(3) If you were made aware of that Pricing Assumption what was your understanding of what it meant?

I didn't see any of this.

(4) If you were not aware of that Pricing Assumption, looking at it now, what do you understand it to mean including, in particular, the phrase in section 3.4.1 that *"normal development and completion of designs means the evolution of design through the stages of preliminary to construction stage and excludes changes of design principle, shape and form and outline specification"*? Can you give examples?

This statement assumes that an effective design and construction contract is in place and that effective teamwork exists. None of these was the case. In any case, it is logically impossible to get price certainty from preliminary design alone.

(5) The "Base Date Design Information" (BDDI) was defined in section 2.3 of Schedule 4 as meaning *"the design information drawings issued to Infraco up to and including 25th November 2007 listed in Appendix H"*. Appendix H did not, however, contain any list of drawings and, instead, simply stated *"All of the Drawings available to Infraco up to and including 25th November 2007"*. Are you aware why Appendix H did not appear to contain a list of drawings comprising the BDDI? Was that related to the difficulties noted above around November 2007 in relation to document control?

Another example of commercial ignorance and impracticality, tabled solely to maintain a programme and the impression of robust progress, but inevitably leading to financial disaster.

2008

May to December

58. By way of overview, in relation to the design work carried out post Infraco contract close and SDS novation:

(1) In general, what design required to be undertaken after novation of the SDS contract?

The design remained to be completed, compounded by the organisational and attitudinal problems remaining.

(2) What were your duties and responsibilities in relation to design, approvals and consents after SDS novation?

Unchanged, because by then Mr Sharp was the SDS project manager. My role was to review and accept offered design packages. In practice, and in the spirit of teamwork, I undertook to clear arising engineering barriers to progress e.g. interfaces with Network Rail.

(3) What changes, if any, took place in the process for producing, reviewing and approving design after SDS novation? (see e.g. letter dated 30 January 2008, CEC01511252, from Damian Sharp enclosing a Design Management Plan, CEC01511253, which he noted *"has been updated to cover the situation beyond financial close and sets out how TIE intends to manage the remaining design and approvals to financial close"*(for a later version v.5.2, dated 14 April 2008, see PBH00018150). See also your e-mail dated 31 March 2008 to Steven Bell, CEC01493287, which noted that BBS required their own Design Management Plan, rather than BBS "amending" TIE's Design Management Plan).

The Design Management Plan said exactly what was required. It changed over time to reflect improvements and take account of current organisation and contract status. Its main provisions remained virtually unchanged.

(4) What control over, and visibility of, design did TIE have after SDS novation?

There was no change when the Design Management Plan was followed. I and my staff continued to liaise directly with SDS if required to assist problem resolution.

(5) Were there difficulties in TIE's control over, and visibility of, post SDS novation design? We note, for example, an e-mail dated 13 March 2009 to PB in which you referred to *"the usual struggle for info!"* (CEC00920014). We further note an e-mail dated 27 January 2010 from Seamus Healy (CEC00559855), Access to BSC design information and supporting documentation, which stated that *"We did have a whole section in the Employer's Requirements on Document Standards and Control, but someone from our side removed it without our knowledge immediately prior to signing ..."* (see also (i) Mr Healy's e-mail dated 27 January 2010 to Stewart McGarrity setting out the section of the Employer's Requirements that had been removed, CEC00617990, (ii) your leter dated 13 January 2010 to BSC seeking access to BSC's document control system, CEC00617991, and (iii) BSC's reponse dated 25 January 2010, CEC00617992). Do you have any knowledge of, or views on, why the section in the Employer's Requirements referred to by Mr Healy had been removed?

Visibility of SDS design activity was maintained even if packages of completed assured design were delayed. I don't know why the ERs were changed in the way described; the control over them was unclear and they were never properly edited to include current requirements and remove ambiguity.

(6) More generally, what difficulties and delays were experienced in the completion of design after SDS novation?

Infraco changed many designs apparently to suit their own design and risk agenda. This resulted in further cost and time escalation.

(7) What were the main reasons for these difficulties and delays?

Finished design was sometimes rejected by the Infraco themselves; they appeared to distrust existing SDS design.

(8) What steps were taken to address these difficulties and delays?

By this time the organisational confusion within tie was further advanced. Even more parties not directly involved with design output seemed to feel that it was their bounden duty to 'improve' (i.e. meddle with) completed design, e.g. commercial team, project management team. This was in addition to the Infraco themselves deciding to adopt many changes to aspects of detailed design.

(9) Were these steps successful (and, if not, why not)?

In my perception they further confused things and further escalated cost and programme effects.

59. On 20 May 2008 you produced an Engineering Services Period 2 Report (CEC01349949). Under Approvals it was noted that TIE's Engineering Team was engaged with unblocking issues and looking ahead to assist in the avoidance of potential conflicts which otherwise could impact on the IFC delivery dates per the SDS programme version 31. That included managing a programme of twice weekly Approvals Task Force meeitngs attended by all relevant parties, and ongoing involvement in informal consultation ahead of SDS submissions.

(1) By way of overview, what steps were taken to try to ensure that IFC drawings were issued, and approvals and consents were obtained, so as not to impact upon the Infraco construction programme?

IFC problems arise because of actual or perceived conflict between design elements (disciplines). The regular discussions were set up to reveal and solve these conflicts or barriers through practical, informed teamwork.

(2) Were these steps successful (and, if not, why not)?

Yes.

60. By e-mail dated 9 September 2008 (CEC01118159) Lindsay Murphy, Project Manager, TIE, circulated a draft letter (CEC01118162) to BSC which attached a document, Operational Design Review Process (CEC01118161), which set out the internal review system being undertaken by Transdev with TIE and CEC *"in the absence of timely design assurance packs, to understand issues affecting the operability of the system design as provided by BSC/PB"*.

That led to various e-mails including an e-mail dated 9 September 2008 from Gavin Murray (TIE00498072) which stated, *"I would [note] however that the design team here have real concerns about the quality and operability of the SDS design. As we have been seeing IFC packages being issued to BSC which are either incomplete or incompatible with ongoing design"* and a further e-mail dated 10 September from Mr Murray which questioned the SDS Inter Disciplinary Review and check processes and noted, *"Unfortunately although SDS gave a very good speech about their QA procedures (about a year into the project) and how the design would be 'right first time every time' we have yet to see the evidence"*.

By e-mail dated 9 September 2008 (TIE00038406) David Crawley noted, *"late delivery and the need to place the construction contract means that the detailed design is not in fact detailed enough, and that even if the full scope expected originally (at the start of the project) of SDS had been delivered, BSC would still have some design to do – e.g. SDS track design really means identification of the alignment and the envelope inside which the actual track design must fit".*

An e-mail from Andy Steel, TSS (TIE00498072) noted *"one thing to do is to quietly prepare the nuclear option – namely JD"* and *"when are tie going to admit that the opening date is now the only driving force and how are they going to avoid putting themselves into a potential 'go to jail' card situation".*

(We understand that the reference to "JD" is a reference to John Dolan, the Independent Competent Person required by the Railways and Other Guided Transport Systems (Safety) Regulations 2006 (ROGS)).

(1) What was your understanding of, and views on, the matters noted above?

SDS design was not intentionally bad. Nor generally was it bad through negligence. The chief cause of SDS design problems or rejections was because of unresolved issues outwith SDS control. Issues with operability could have arisen through personnel changes, the bringing on of Transdev and consequent new subjective judgement being applied. This also could have been the case when the ROGS-required Independent Competent Person (ICP) John Dolan was appointed, although in practice ICP input was well-founded. The point about Infraco starting work with incomplete design could possibly have been a workable way forward had contractual weaknesses and battles not prevailed.

But overlaying everything was the ever-constant thrust to maintain programme, regardless of practicality or cost. A prime example of the folly of this approach was the need to dig up Princes Street twice. The initial track-laying attempt was fundamentally flawed because inadequate supervision by Infraco, together with appalling weather conditions, meant that the installed track did not meet stray traction current requirements. So it all had to be dug up again and reinsulated, causing greatly extended inconvenience to traffic and retail premises along Princes St. This should have been foreseen.

(2) We should also draw to your attention the e-mail dated 9 September 2008 from Lindsay Murphy in the above chain (TIE00498072) which observed that you were not *"coming in much as he has no role, objectives, resource or influence"* and that, in an e-mail dated 17 September 2008 to Willie Gallagher, Jim McEwan stated he did not consider that you were "pulling your weight" (TIE00034418). What is your response to these comments? More generally, approximately how many days a week were you working on the tram project around that time? Approximately how many days a week were you in TIE's Edinburgh office?

Lindsay's remark probably reflected my exasperation at the inability of tie to operate effectively. The way I changed my work pattern was still to work 4 days a week, but for one of those days to be off-site where I could work in an environment conducive to concentration without distraction. At this point Mr McEwan's activities seemed to be driven more by a desire to reduce project expenditure than to achieve a specific VE result.

61. In an e-mail dated 15 September 2008 (TIE00498192) Tom Cotter, TIE, noted that BSC had submitted a change request to redesign the Russell Road Retaining Wall and that, apparently, the original design was progressed before establishing the actual location of the utilities.

(1) What is your recollection of that matter?

I have no recollection of that detail.

(2) Is that an example of detailed design having been progressed on an assumption that turned out to be wrong and requiring a subsequent change in design? Was the Russell Road Retaining Wall one of the critical issues that were progressed in 2007 as a result of proceeding on assumptions?

I have no recollection of that detail.

62. A meeting was held on 16 September 2008 on BSC/SDS Design Assurance (TIE00500425). The purpose of the meeting was stated to be *"To enable tie/CEC to understand how SDS will issue complete, coherent, assured design which will be ultimately acceptable. This is against the background of: continued programme slippage; IFC design preceding full IDC and DAS processes; the plethora of CEC comments still arising on approvals submissions; output from tie/Transdev's recently stated operability reviews; the need for demonstrable resolution of past design reviews by tie et all; [and] the need for visible evidence of risk assessment and hazard mitigation to fulfil the requirements of ROGS"*.

(1) It would be helpful if, by way of overview, you could explain your understanding of, and views on, the above matters at that time?

The continuing problems and constant disputes and finger-pointing called for a get together of like-minded people who had the right approach to addressing these issues. That's why the meeting was set up.

(2) What steps were taken to addressed these matters?

The meeting helped all parties present to understand the issues perceived from each viewpoint. It improved things somewhat but the embedded and unchanging organisational and contractual issues remained the chief barrier to progress.

(3) Were these steps successful (and, if not, why not)?

They were successful within the constraints of the ongoing organisational and contractual issues. As if it wasn't hard enough to gain CEC approval to almost anything, the number of other outside parties, some of which are mentioned in these meeting notes, will give some idea of the scale of the obstacles to progressing design. Each party had its own vested interests and there was no London Mayor-like, overall 'Edinburgh first' direction to constructively regulate endless comments and issues.

63. An undated document (in period 7, 2008/09) notes (item 1.10) that you were *"leading review of all outstanding design issues"*.

(1) Did you carry out such a review?

It was a continuous process throughout.

(2) If so, what were your main conclusions and recommendations? (see also e.g. your e-mail dated 25 March 2009, Top 17 Risks and the SDS Understanding, TIE00037798)

Without the list I cannot recall the detail. However, the whole point of our activity was not to wait passively for completed, assured design to be submitted, but actively to monitor progress through frequent discussion so as to solve arising problems as early as possible.

64. In an e-mail dated 12 November 2008 (CEC01109031) you noted certain issues in relation to "DAS review – contractual obligations" and referred to *"this miserable state of affairs"*.
A spread sheet attached to your e-mail showed the delays in the production of Design Assurance Statements for the different sub-sections (CEC01109032).

(1) It would be helpful if you could explain the issue raised in your e-mail and your views including, for the avoidance of doubt, what was the "miserable state of affairs"?

The "miserable state of affairs" was, as always, the continuing delays to design completion and my team's consequent exasperation, especially because most causes were outwith our and SDS' control.

2009

65. In an e-mail dated 31 March 2009 to Andy Steel, TSS (CEC00970253), you noted the *"dramatic reduction in the time allocated to you and your associated design review resource w.e.f. tomorrow"*.

(1) Why was there a dramatic reduction in the time allocated to TSS and TSS' associated design review service at that time?

Their budget had been exhausted too early because TSS had reviewed large amounts of stuff too early on (before my arrival on the project) and had used up ther allocated resources.

66. An e-mail dated 6 April 2009 from Sinead Scott, Engineering Manager, Transdev (CEC00943093) attached minutes from an Operational Design Review (ODR) workshop held on 26 March 2009 on Sections 5a, 5b, 15c, 6 and 7A (CEC00943095) and an ODR tracker (CEC00943094).

See also (i) a letter dated 13 August 2009 from Martin Foerder, Project Director, BSC enclosing a copy of the ODR register with SDS's comments (TIE00505319) and (ii) an e-mail dated 12 March 2010 (CEC00529499) circulating an updated version of the ODR tracker (CEC00529503).

(1) By way of overview, what was the purpose of the ODR process?

To review the offered design to ensure that it met the requirements of the operators Transdev.

(2) Why was the ODR process still ongoing in 2009 and 2010?

Just as CEC, tie commercial, tie project management, TSS, TEL, Infraco, Forth Ports, SRU, Network Rail, Utility companies etc etc wanted their say over design, so did Transdev. In many ways this approach to allowing constant 'bites of the cherry' squandered skilled time, cost and programme allowances and was a major driver of cost and programme escalation.

(3) To what extent, if at all, did the ODR process result in changes to the Base Date Design Information (BDDI) design and Infraco Notification of TIE Changes (INTCs)?

I have no knowledge of that.

67. "SCWP" (we presume this is a reference to the Stray Current Working Party) meeting number 15 was held on 16 April 2009 (CEC00917980) and included attendees from TIE, Siemens and statutory utility companies.

(See also, in that regard, a draft Memorandum of Understanding dated 28 May 2009 between TIE, TEL, CEC and the Utility companies, CEC00985845).

(1) It would be helpful if, by way of overview, you could explain the purpose of the SCWP and why these issues were still outstanding in 2009?

Uncontrolled stray traction current can cause problems to Utility companies assets (corrosion leading to catastrophic failure) and to Network Rail assets (principally unsafe interference with their signalling system). The issues are complex and notoriously hard to identify and control. The SCWP was set up to ensure that all affected and contributory parties were able to discuss and agree susceptibilities and control measures.

(2) Did the issues considered by the SCWP prevent the completion of design and/or lead to changes to the BDDI design (and INTCs)?

No. The principal issue was detailed trackform design and the Rheda City system used by Infraco inherently provided for effective stray current control when correctly installed with the required additional insulation measures, especially in Princes Street.

(3) Do you recall approximately when all of the issues considered by the SCWP were finally resolved?

The design requirements were agreed and established before Princes Street track was installed. Testing of that installation proved that the requirements had not been met (for the reasons outlined previously in my responses herein). That part of the route had to be dug up and reinsulated before the control measures were deemed effective. After my time on the project there would have been overall testing performed to ensure that the requirements of all affected parties were satisfied by the control measures (i.e. track insulation).

68. In an e-mail dated 30 April 2009 (TIE00037854) you noted that SDS had failed to provide Design Assurance Statements in the agreed form and that *"their offerings usually come with the implication 'the answers are all in there, go and find them'"*.

You noted in an e-mail of the same date in the same chain that when the anticipated Design Assurance Statement packages eventually arrived, *"I am ... expecting that they will be just like the last ones i.e. they will be lists and lists of documents, loads of pages and ... absolutely no evidence, or even pointers to evidence, of how the well known litany of hazards and top risks have been mitigated. If that proves to be the case, then all the discussion over the last 2 years, culminating in a meeting held on 22 April this year, will have been in vain. They will be valueless. I will be depressed"*. See also your e-mail dated 27 May 2009 to Robert Kraemer, BSC (TIE00502629) which noted that *"A design can only be considered fit for purpose upon acceptance of the offered DAS. No complete DAS has ever been offered to tie so far – hence tie has NOT to date accepted any design as being fit for purpose. The assignment of the status 'IFC' to any design package issued so far has been entirely outside of the DAS process"*.

(1) Do you have any comments on the matters noted above?

It was unrealistic of SDS to assume that they could present packages of enormous volume and detail in the form they did. They knew what was required in the way of design assurance evidence, and I can only assume that the people who knew that were redirected merely to dump a deluge of documents on tie's table without the essential coordination and supporting evidence and discussion.

(2) Were complete, and final, DAS packages ever supplied to TIE? If not, how was TIE able to accept design as being fit for purpose?

Not in the form expected during my time with tie.

69. By letter dated 22 May 2009 (CEC00974210) Martin Foerder, BSC, sent TIE a design programme (based on Infraco Programme Revision 2, submitted to TIE on 20 May 2009), with a base date of 31 March 2009.

(1) What was your understanding as to when design was due to finish in the design programme submitted by BSC with that letter?

I don't recall and looking at this document it is unclear and probably questionable.

70. In an e-mail dated 24 June 2009 Lindsay Murphy, Project Manager, TIE (CEC00859962) set out certain concerns.

(1) What was your understanding of, and views on, the matters set out in Ms Murphy's e-mail?

It was another example of ineffective teamwork between CEC and SDS for whatever reason. In this specific case I don't recall who was right and what the resolution was.

71. In an e-mail dated 7 October 2009 (CEC00797688) you responded to Steven Bell's e-mail of the same date raising concerns that sums had been paid to Network Rail that had not been accounted for in TIE's budget and were, therefore, outwith the delegated authorities of the board.

(1) By way of overview, what was the issue and how had it arisen?

I can add little to the letter referred to. I recall my feelings of injustice at the time for being blamed for something of which I had no knowledge because of the negligence of others during a transfer of responsibilities to me. The matter was not raised with me again so I can only assume that the correct red faces were identified subsequently.

(2) Had sums been paid outwith the delegated authorites of the board (and, if so, approximately how much had been paid and how was that resolved)?

My response above applies.

72. An e-mail dated 18 December 2009 from Miguel Berrozpe, Project Director, Siemens plc (TIE00365855) noted that *"we are talking of 6 months manufacturing lead times here, AFTER design concluded and approved!"*.

(1) It would be helpful if you could clarify the type of component that Mr Berrozpe was referring to that required manufacturing lead times of six months?

Track components, specifically point components (planed and shaped rail switches and manganese crossings to unusual geometries) as I recall.

(2) By way of overview, to what extent did delay in completing and approving design result in delays to construction because of such manufacturing lead times?

Not aware of any such delay – but possibly because other delays masked this factor.

2010

73. An e-mail dated 3 January 2010 from Andy Steel (TIE00727845) attached a document commenting on a review to the Dynamic Kinematic Envelope (DKE) of CAF's tram (TIE00727846).

(1) By way of overview, to what extent, if at all, did changes to the DKE and/or changes to trackform cause changes to the BDDI design (and INTCs)?

I have no knowledge of this.

74. By e-mail dated 1 May 2010 (CEC00307572) you sent Susan Clark a draft paper on "SDS Design Assurance – an historical overview" (CEC00307573) (and a DAS tracker, CEC02085619).

The paper noted that *"Currently, tie has limited information from BSC relating to the reasons for changes"* and that *"SDS consistently has failed to produce evidence of effective Design Assurance and design integration across all disciplines"* (page 1).

It was noted that there were chronic issues with design packages and self-review and that *"There were always many issues concerning non-integration due to ineffective co-ordination of the various disparate design teams within SDS"* (page 3).

It was noted that the schedules of design packages ready for review never worked and that *"A key reason for this [was] the massive volume of CEC comments on offered design, resulting in a continual hiatus within SDS design sections in attempting to determine whether the comments were valid and, if they were, to address them – these SDS processes being invisible, but very obviously slow"* (pages 3-4).

For a later version, described as first full draft, dated 23 June 2010, see (CEC00412129),

(1) It would be helpful if you could explain the purpose of the paper and your views on the matters noted above?

Ms Clark "required" me to produce it for a purpose unknown to me.

(2) Do you have any other comments on the draft paper?

No

(3) In general, to what extent did a lack of integration of design result in a change to the BDDI design (and INTCs)?

I don't recall the detail but it would have been inevitable.

(4) Again, in general, to what extent did CEC comments on design result in change to the BDDI design (and INTCs)?

Again, I don't recall the detail but it would have been inevitable.

75. Marshall Poulton, Tram Monitoring Officer, produced a draft report in June 2010, "Tram Project Assurance Review" (CEC00230821). The Executive Summary included criticisms of TIE and the SDS Provider.

(1) Do you have any comments on the matters in the Executive Summary?

No. But the overall report typically gives a very high-level view, not necessarily related to what was actually happening at a technical and operational level. It is always fascinating to see plaudits being given at high level, and brickbats lobbed at to those charged with actual delivery – especially when those lauded are the very people accountable for the results.

76. In June 2010, Robert Burt and John Hughes, Acutus, produced a draft Report on investigations into delays incurred to certain elements of the Infraco works (CEC00443401).

(1) Did you see that report at the time? Did you play any part in the preparation of that report (e.g. by providing information to the authors)?

No to both questions.

(2) It would be helpful, in any event, if you could provide your views on the matters discussed in the Executive Summary (pages 4-5)?

It is a report prepared by quantity surveyors and lawyers on a highly complex major engineering project. As such, it will not necessarily have probed and understood the voluminous technical detail that was at the root of the derailment of project timescales.

77. By letter dated 9 August 2010 (TIE00510807) BSC sent TIE interim, or draft, Design Assurance Statements for the Civils (SDS) and System (Siemens) packages of design, with the Integrated (BSC) DAS to follow for each geographical section.

The letter noted, *"BSC has produced an assured and integrated design in so much as the attached DASs per packages of design follow the Infraco IDC and DAS process as described in the Infraco Design Management Plan and IDC and DAS Plan. However, it needs to be recognised and acknowledged that each DAS is produced to a point in time (End July 2010) and highlights the outstanding requirements that need to be resolved prior to the completion of the final assured and integrated design for each geographical sections and issuance to tie of the final DASs".*

The draft DAS's sent at that time were (TIE00510797) to (TIE00510806).

(1) What was your understanding of, and views on, why draft, rather than final, DASs had been produced?

They could not have been finalised with so many issues outstanding.

(2) Did the draft DASs produced at this time meet TIE's requirements and expectations?

My recollection is that they were a step forward but still failed to meet the overall requirement of explicity demonstrating how the offered package achieved compliance with overall requirements.

(3) Were a complete set of final DASs ever produced (and, if so, when)?

Not within my time on the project.

2011

78. By e-mail dated 7 March 2011 (BFB00056554), Simon Nesbitt, BSC, enclosed responses to certain assertions made by TIE prior to the Mar Hall mediation (BFB00056555) and (BFB00056556).

(1) Do you have any comments on what is said in these documents?

I was not involved in any of this and have no comment to make.

79. Mediation discussions took place at Mar Hall in March 2011, following which a Settlement Agreement was reached in September 2011 for completion of a line from the Airport to York Place. By way of overview:

(1) What was your involvement, if any, in the Mar Hall mediation?

None

(2) What were your views on the outcome of the mediation?

I have no knowledge of this.

(3) What involvement, if any, did you have in the tram project after the Mar Hall mediation?

My involvement with the project ended at the end of March 2011.

80. In relation to when you left TIE:

(1) For completeness, when (and why) did you leave TIE?

At the end of March 2011. Another individual took my place.

(2) What was your understanding when you left TIE of (i) the extent to which design was complete (and all approvals and consents had been obtained) and (ii) when all outstanding design would be completed (and all outstanding approvals and consents would be obtained)?

I only recall that, generally, there was still much detail to resolved and agreed between parties.

(3) Similarly, what was your understanding when you left TIE of (i) the extent to which the utilities diversion works were completed and (ii) when all outstanding utilities diversion works would be completed?

I was not closely involved with the detail of that element of the project.

Project Management and Governance etc

81. In relation to TIE (and to the extent not already covered above) :

(1) Did you have any concerns, at any stage, in relation to TIE's management of the tram project or in relation to senior personnel within TIE?

The Chairmen and Board were distant and disconnected. Their focus became one of keeping the media happy, without necessarily finding out what actually was happening. The senior project team enjoyed flexing their egos and didn't understand teamwork. It seemed to me as though the commercial team were focussed on numbers arising from stuff they didn't understand and multiplied confusion and turbulence.

(2) To what extent, if at all, do you consider that changing personnel (whether within TIE or the main contractors) caused or contributed to the problems that arose?

When teams were introduced or augmented there was little if any time given to effective consideration of their roles and how those roles complemented existing ones without dilution or confliction.

(3) Do you have any views on whether any communication issues between the different parts of TIE (e.g. the design, utilities, infraco, commercial and procurement teams) caused or contributed to the problems that arose?

There was insufficient effective communication.

82. In relation to other bodies and organisations with responsibilities for the tram project (including, for example, CEC, TEL and Transport Scotland).

(1) Did you have any concerns, at any stage, in relation to these bodies and organisations, including the senior personnel in these bodies and organisations?

I have no opinion.

83. In relation to the main contractors involved in the tram project (including, in particular, the design, utility and infrastructure contractors) (and to the extent not already covered above):

(1) Did you have any concerns, at any stage, in relation to these contractors, including the senior personnel in these contractors?

I was not involved in such a way as to form an opinion.

Final Thoughts

84. By way of final comments:

(1) How did your experience of the Edinburgh Tram Project compare with other projects you have worked on (both previously and subsequently)?

My experiences were good initially and I saw a real desire to get a grip of the problems and solve them. But as the tie team and organisation grew it became less effective. My last year there was the least enjoyable of my entire career, dealing with constant and ever growing confusion and hubris.

(2) Do you have any comments, with the benefit of hindsight, on how the design difficulties and delays might have been avoided or reduced or on how the design contract and works, or the tram project more generally, could have been better managed?

Clear specification, organisational clarity, experienced people, realistic expectations, team approach to problem solving and progress, courage to 'take stock' when necessary.

(3) Are there any final comments you would like to make that fall within the Inquiry's Terms of Reference and which have not already been covered in your answers to the above questions?

No.

I confirm that the facts to which I attest in the answers contained within this document, consisting of this and the preceding 45 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.

19 June 2017