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**From:** John Dolan [Dolan.J@Interfleet.co.uk]  
**Sent:** 12 October 2007 15:25  
**To:** Tony Glazebrook; David Crawley  
**Cc:** Tom Condie  
**Subject:** ICP comments on Design Review

David / Tony

As discussed yesterday, two principal issues arose from my observation of the Design Reviews on Thursday 11/10/07, and my on-going sampling of Design Specifications.

First

I was concerned that, during the reviews, members of tie's team were answering issues raised that were properly matters for the designers, who need to be able to justify their own decisions. I have previously raised a formal ICP Request for Information over tie's involvement in Value Engineering, and the implications of that for Independent Safety Verification (and am still awaiting a response). I should have expected that this would have prompted a review and that steps would have been taken to ensure that independence was not infringed in other related ways.

Second

The design specifications that I have reviewed seemed to have been prepared for use by single teams, each with a limited asset range, and the designs reviewed at the Design Review appeared to have been very much prepared by a single asset team. Whilst each design team indicated an awareness of interfaces with other design teams, there was little convincing evidence that its design was prepared with a full understanding of, and a deliberate attempt to integrate with, other design teams. I should have expected the designs to have been prepared on an integrated basis from the start, rather than team "A" simply passing matters to team "B" as, essentially, a *fait accompli*.

Two examples are given as a Postscript. These are evidence of the symptoms rather than being particularly significant in their own right.

The response to issues of integration was to make reference to the Interdisciplinary Design Check. Whilst I note that this is in place, it should be a review check, not the process that considers design integration for the first time.

I am also concerned that the designers do not appear to, *ab initio*, consider Operations and Maintenance. It is all very well to refer to the future role of Infracore in establishing this. However, there is a significant danger that, because a design has been prepared and agreed by other parties within tie, by the City, by other stakeholders, etc., and been included in the documentation supplied to bidders, it becomes virtually impossible to revise the design, with, potentially, sub-optimal functionality impinging on safety.

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 potential 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.

Regards

**Eur Ing John Dolan**  
**Principal Consultant**  
Interfleet Technology Ltd  
Exchange Tower, 1 Harbour Exchange Square

London E14 9GE  
dolan.j@interfleet.co.uk  
Tel: +44 (0) [REDACTED]  
Fax: +44 (0)20 7987 4830

[www.interfleet-technology.com](http://www.interfleet-technology.com)

Example 1 - I should expect the OLE mast designs, layouts, spans, etc., to be prepared with a understanding of the ground loadings, need for piling, etc., rather than a list of loads for the Structures Engineer being prepared at the end of the design process. Integrated thinking might, for example, lead to an early realisation that, on a particular section of made-up ground, a headspan (with lower mast loadings) might give greater long-term assurance of OLE stability (required for both safety and functionality during the operating phase) than a single side cantilever mast for the double track, with greater vertical loads, moments and torques. It might also have avoided an alternative design sketch having to be tabled during the Design Review, to deal with an OLE / highways issue.

Example 2 - The design for a substation had clearly been superimposed on a plan without thought of levels - the plan showed a slope between sub-station and track, but the cross-section showed the substation to be level with the track. It was also unclear if the effect of the trees actually on the site (which are to remain) were considered when a "lift in" fully fitted-out substation was assumed as the solution - the drawings showed "ideal" lowish bushes, no more than about 3m high..

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Interfleet Technology Ltd  
Registered Office: Interfleet House, Pride Parkway, Derby DE24 8HX  
UK  
Tel: +44 (0) 1332 223000 Fax: +44 (0) 1332 223001  
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