Recent news and goals for LCWS 2014

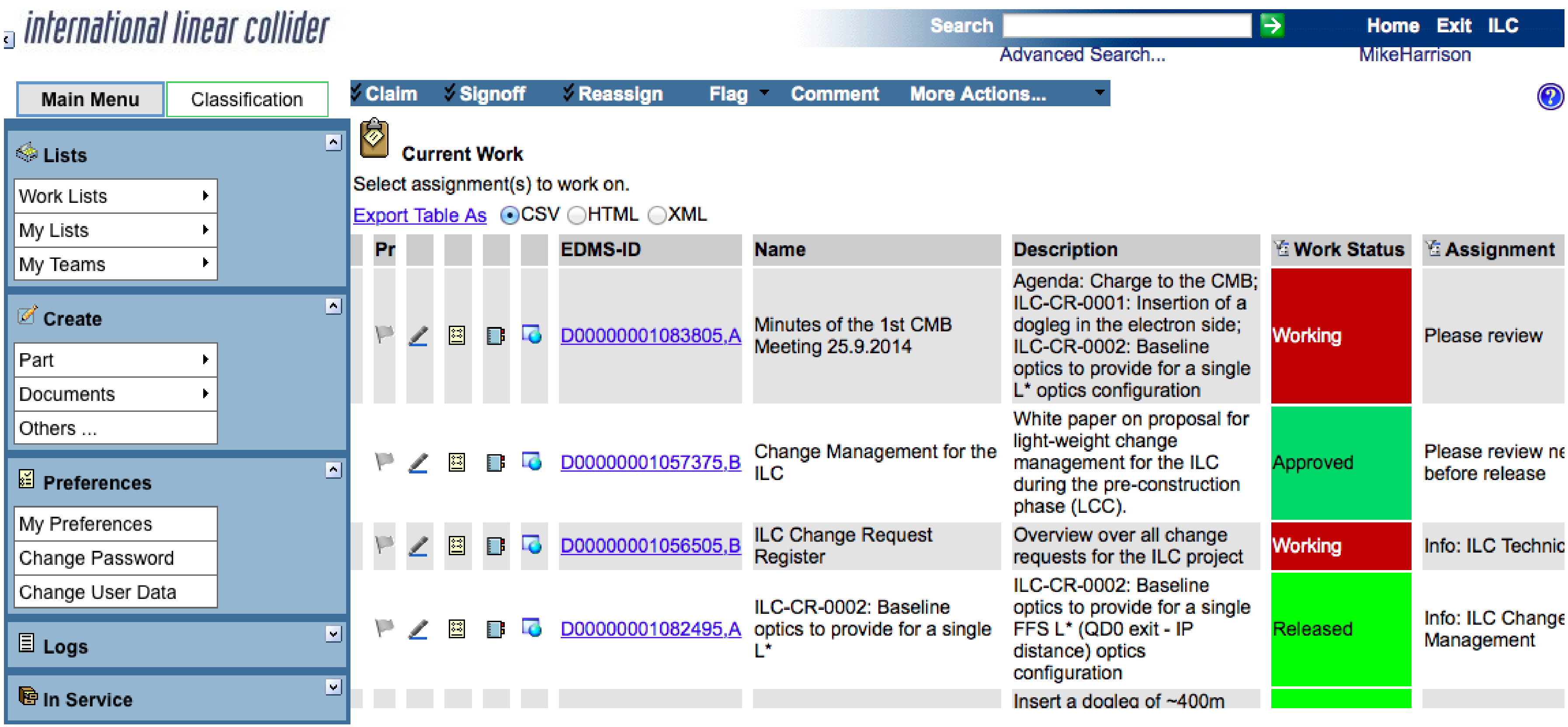
Mike Harrison

Baseline Changes
Conventional Facilities Footprint
News

Baseline Changes

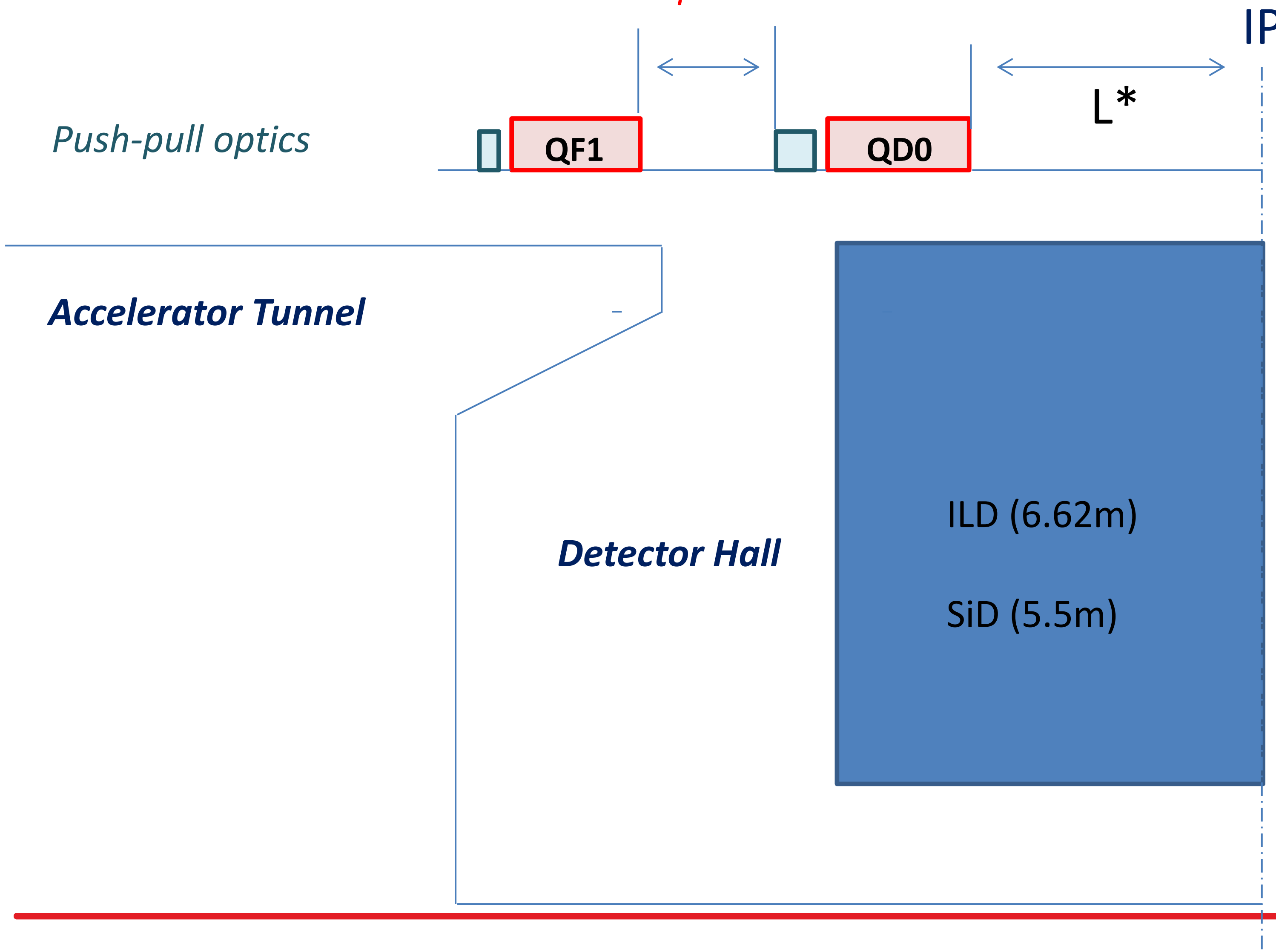
We are starting to update the TDR baseline design to reflect post-TDR & site specific input.

Fully documented on EDMS



CR-002 – equalize L* for both Detectors

How much space do we need?



Toshiyuki Okugi

CR-002 – equalize L* for both Detectors

Unequal L* is not a *fundamental design or cost issue*

- We have feasible optics solutions

Having different L* will cause significant tuning differences between detectors

- both luminosity and backgrounds
- negative impact on push-pull recovery times
- difficult to guarantee equal luminosity performance

Primary issue is operational luminosity performance and risk mitigation

- harder to quantify, so arguments tend to be more fuzzy
- But based on considerable experimental and theoretical experience with this FFS design (ATF2)

L* is a fundamental parameter that drives many critical design features of the BDS. As L* gets longer

- Chromatic (and geometric) corrections become more challenging
- Overall larger beta functions drive tolerances (field and alignment) become more demanding
- Shielding IR from SR fan becomes harder
- collimation depth becomes tighter for fixed IR apertures
- tighter collimation tighter jitter tolerances from wakefields etc.

Glen White

CR-002 – equalize L* for both Detectors

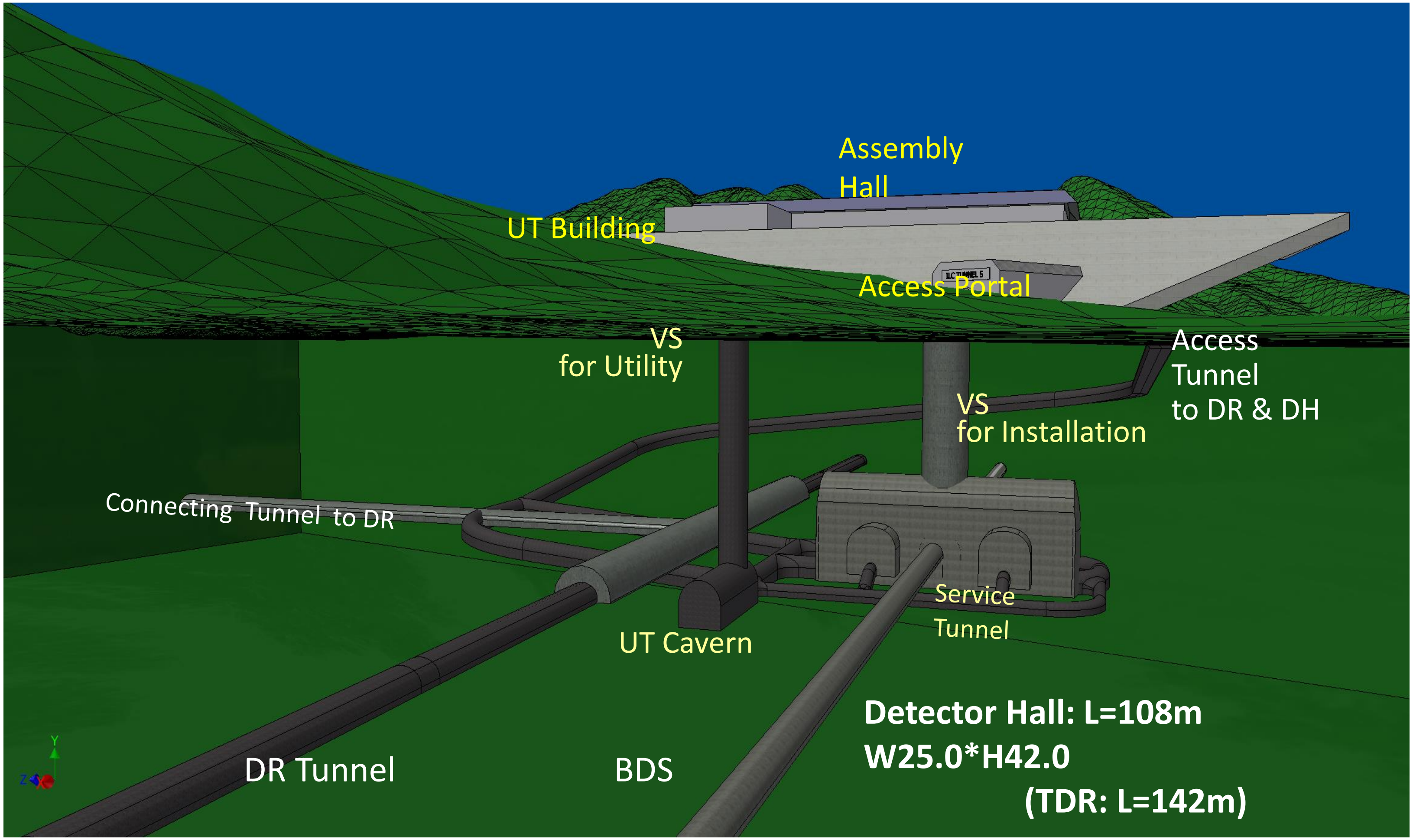
ILD L* is 4.5m, SiD L* is 3.5m thus the hope is to reduce ILD. A significant part of the L* difference is due to the presence of a vacuum pump in the ILD layout.

In addition the QD0 magnet design might be more compact

In view of the multi-dimensional complexity of this issue we have formed a CR panel under Nobuhiro Teranuma to provide recommendations to the CMB.

CR-003 – Detector Hall design

A site specific change: principle feature an 18m vertical shaft



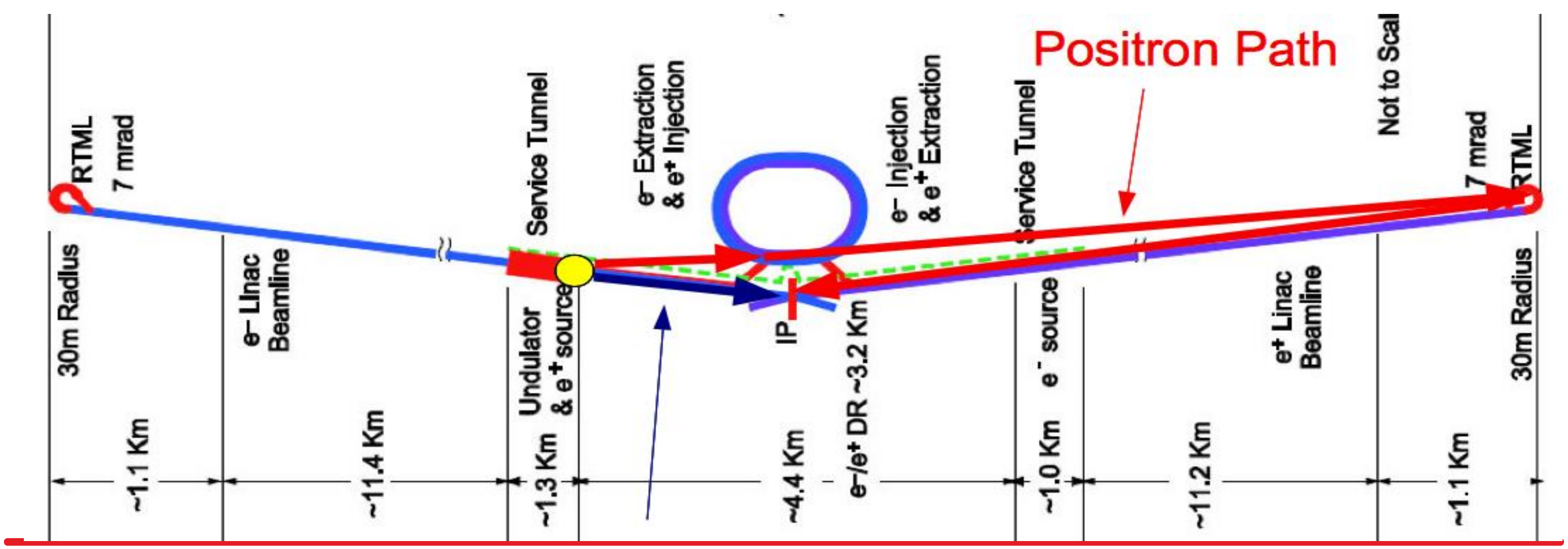
Machine Footprint – Timing constraints

Positron bunches are produced from their "partner" electron bunches

-> new positron bunches are injected into DR while old (damped) positrons are still in

Simplest solution: each e+ bunch goes into exactly the same bucket that was occupied by colliding e+ bunch

- e+ bunch is ejected from DR, travels down RTML and Main Linac, while
- empty bucket left by e+ bunch rotates around DR several times
- Partner e- bunch creates new e+ bunch
- e+ arrives exactly at DR in time to fill rotating void bucket, while
- e- and e+ bunches collide at IP



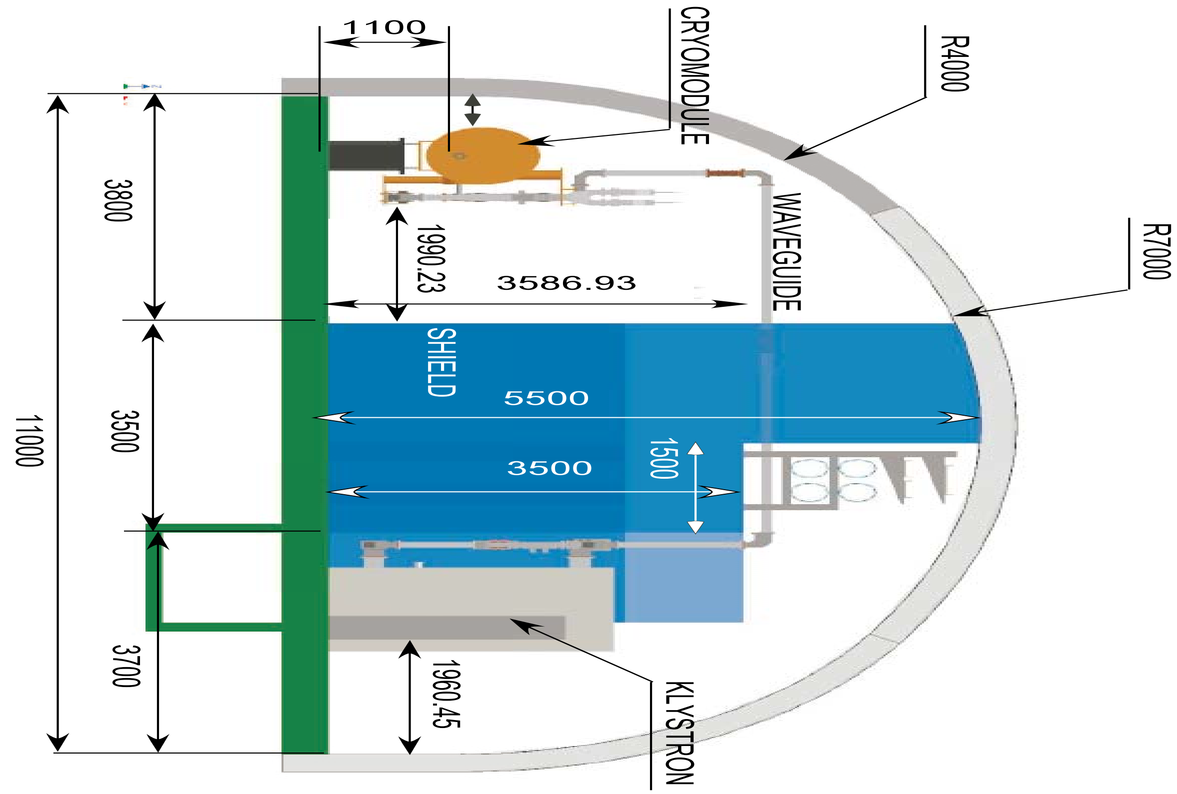
Machine Footprint – Timing constraints

There are 3 different scales to this e+/e- path difference problem

Length Scale	
ΔL quantized DR/2	Needs final site and design layout and is required soon. Need to check present lattice designs for completeness and propose the lattice and layout change options to correct path length, ΔL≈0. This must be compatible with any staging or upgrade scenarios!
ΔL < 0.5 m	Needs study of Survey and Alignment above and below ground and used during design, construction, installation and commissioning.
ΔL ≈ 1 mm	Need study and estimate of variations in path-lengths during operation, both magnitude and timescale, hours,days,years.

The timing WG will report at this meeting

Tunnel Layout – Radiation Shielding



What is the worst case accident scenario ? Active – Passive etc….

Initial Discussion at this meeting

LINEAR COLLIDER COLLABORATION

CM2 Testing @ Fermilab

"High Performance" cryomodule test
At Fermilab – last week

Marginally above 3.15 MV/m
The ILC specification

RF timing vacuum llrf cryo water diag motors

! Gradients

N:M1C1CV	Cavity 1 Voltage	31.948193	MV/m
N:M1C2CV	Cavity 2 Voltage	30.803377	MV/m
N:M1C3CV	Cavity 3 Voltage	31.7883	MV/m
N:M1C4CV	Cavity 4 Voltage	31.715298	MV/m
N:M1C5CV	Cavity 5 Voltage	31.532362	MV/m
N:M1C6CV	Cavity 6 Voltage	31.262537	MV/m
N:M1C7CV	Cavity 7 Voltage	31.608021	MV/m
N:M1C8CV	Cavity 8 Voltage	31.421196	MV/m
N:M1CVSM	CM-1 Sum Voltage	252.4	MV/m

News - Resources

We are starting to get feedback from the agencies in recognition of the fact that we need some support during the “pre-decision phase” although nothing yet in hand but:

Japan €8M/yr
US €5M/yr (P5 report critical)
Europe, of course, remains opaque but head count slowly improving.

We anticipate that this state of affairs will not change significantly until a Japanese decision is forthcoming.

It does however provide a basis for planning