Synopsis of PM thinking on 'Near-term concepts for ADI process'.

It is intended to seed your questions and comments. Please have a look and prepare comments.

We will briefly go through it at the beginning of the meeting Wednesday 03.02.2010.

We will use your input to develop a presentation for the GDE Executive Committee. (to be presented Monday 08.02.2010).

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General Comments:

1) Schedule
    a) Given the ~ 3 years for TDP2, we may expect it will take:
        i. one year for the definition of the new baseline (2010), - including adoption of the SB2009 proposal itself, with modifications
        ii. one year to develop it, and
        iii. a final year to complete the report itself.
    b) Large Baseline changes must be incorporated in 2010
        i. This will be done step-by-step,
        ii. Different general criteria will be used for each one
    c) TDP2 resource availability will limit progress, we have to approach the process realistically
2) Process
    a) The Project Director will initiate an approval process
        i. To be applied for those changes (WA) which have either: large cost increment, change in scope with respect to the original ILCSC document, or increased performance risk
        ii. Consistent with preliminary comments from AAP
        iii. will require additional work – the proposal itself is insufficient
    b) Many of the changes we contemplate lie below the threshold. For these, we must consider the mechanism for keeping track of cost details and etc.

Notes on specific Working Assumptions

1) WA1. A Main Linac length consistent with an *average* accelerating gradient of 31.5 MV/m and maximum operational beam energy of 250 GeV, together with a High-Level RF distribution scheme which optimally supports a spread of individual cavity gradients.
    a. As presented to AAP, this idea was not fully developed.
    b. We also should commit to finalizing the re-evaluation during the initial phase of TDP2.
    c. If we intend to propose a gradient change that is large enough to have a substantial cost impact, we should anticipate the additional effort required to achieve Project Director approval, as noted above.

2) WA2. A single-tunnel solution for the Main Linacs and RTML, with two possible variants for the High-Level RF (HLRF):
    a. Klystron cluster scheme (KCS);
    b. Distributed RF Source scheme (DRFS).

    c. We will not be able to adopt these changes without reservation, i.e. they will not be fully demonstrated by the end of TDP2.
    d. we may have to promise a specific set of RD goals - some of which may lie beyond TDP2.
    e. We should choose practical targets, such as
        i. the successful deployment of the EU-XFEL HLRF system,
        ii. successful demonstration of initial KCS power handling RD goals, and a
        iii. successful cost review of the DRFS.
    f. Perhaps most importantly – we have to convince ourselves of these HLRF schemes.

3) WA3. Undulator-based positron source located at the end of the electron Main Linac (250 GeV), in conjunction with a Quarter-wave transformer as capture device.
    a. We should try to keep separate:
        i. the relocation of the source, and
        ii. the adoption of the QWT over the RDR FC.
    b. The approval process will consider both technical and performance scope issues

4) WA4. A lower beam-power parameter set with the number of bunches per pulse reduced by a factor of two (nb = 1312), as compared to the nominal RDR parameter set.
    a. Technically, there are two aspects:
        i. a simple reduction of the beam power by a factor of two, and
        ii. better understanding of the beam-beam issues.
    b. These are completely separate with the exception we are trying to sell one as a mitigation of the impact of the other.
    c. The approval process will consider both technical and performance scope issues, as above

5) WA5. Reduced circumference Damping Rings (~3.2 km) at 5 GeV with a 6 mm bunch length
    a. plan to keep both the 3 and 6km options going, at least until the end of the year
    b. Option: 3 rings in a 3 km circumference tunnel

6) WA6. Single-stage bunch compressor with a compression ratio of 20.
    a. Performance scope – what are the limits
    b. Upgrade / restoration path

7) WA7. Integration of the positron and electron sources into a common “central region beam tunnel”, together with the BDS, resulting in an overall simplification of civil construction in the central region.
    a. Ongoing ‘value engineering’ work aimed at:
        i. Installation
        ii. Maintenance
        iii. Cfs criteria