

# Potential Design Changes and Constraints

Jim Clarke  
Magnetics and Radiation Sources Group  
ASTeC  
STFC Daresbury Laboratory



## ED Phase Boundary Conditions

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- It's important we understand the boundary conditions we are working within
- We have to be efficient with our limited resources
- Four Issues:
  - What changes are allowed or worth pursuing?
  - How do we handle upgrades in the EDR?
  - Stating our starting assumptions
  - Availability requirements

## Design Changes: How radical can we be?

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- Our understanding is that we must work to reduce the cost whilst maintaining the spec (value engineering)
- There are a number of potential changes we could make which (look like they) will reduce the cost
- Some are major changes of design or philosophy
- How much freedom do we have to explore/propose these changes?
- What are the boundary conditions for the ED phase?

## Example Potential Changes

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- Change undulator location to end of main linac
- Change underlying assumption of yield of  $1.5 e^+$  in DR for every  $e^-$  in undulator
- Reduction of DR acceptance allowed
- Reduce undulator chicane offset from 2.5m to  $< 1m$
- Use dog-leg instead (linacs no longer coaxial)
- Use 3 bump insert
- Maximise  $e^+$  polarisation to increase effective luminosity, enabling scaling back of ILC parameters
- Remove keep alive source
- ...

## Boundary conditions: Upgrades

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- What are the upgrades?
- How do we deal with them?
  
- 60%  $e^+$  polarisation
- 1 TeV energy upgrade
- $e^- e^-$
- gamma-gamma
  
- How much attention should we give them?
- Just leave space for extra undulator etc?
- Energy upgrade  $e^+$  solution is not well thought through, does this matter?

## Basic Assumptions

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- Hot cell facility for all of ILC on surface
- Electron or 'small scale' positron source needed for commissioning – where does this source go?
- ~30% polarisation should be preserved
- No straight through beamline at undulator insert
- On request we will be provided with costs and designs for:
  - Conventional magnets
  - Controls
  - (Standard) vacuum systems
  - Services (eg utilities)
  - Installation effort (eg inventory control)
  - CF & S
  - Instrumentation

## Availability

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- How is this going to be handled?
- What is our availability budget?
- Do we design undulators for MTBF of 1, 10 or 100 years?
- Target changeover time to be hours or days?

## Warning

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- Many questions have been posed here
- We have our own opinions of course
- If we don't get clear guidance from above we'll decide for ourselves !