



DR BTR Close Out

“All our final decisions are made in a state of mind that is not going to last.”

Marcel Proust



The TDR Baseline

- **Scenarios to consider (definition)**
 - 5 Hz “standard running” nb = 1312 bunches
 - 10 Hz “alternate mode” nb = 1312 bunches
- **Luminosity upgrade scenario**
 - 5 Hz running with nb=2625 bunches
- **3.2 km ring**
 - baseline: two rings (electron / positron) space + mandatory CFS support for a third
 - luminosity upgrade: construct second e+ ring (if needed)

Already decided TLCC



The TDR baseline

- **Lattice: DTC1 ring (based on TME cell)**
- **All e-cloud proposed mitigation techniques *for positron ring***
 - electron ring vacuum likely to diverge
 - design work focus on positron ring (resources)
 - do some simulation work for e- ring (tune footprint)
 - Evaluate cost-breakdown for e+ ring vacuum solution once available
 - what can we leave out for e- ring



TDR Baseline

Needs update
See next slide

- RF Parameters (ILC-EDMS)

			Baseline	L upgrade	10 Hz mode	
Energy loss per turn		MeV	4.5	4.5	6.2	8.4
Wiggler field	<i>B</i>	T	1.1	0.7	2.0	2.4
Wiggler period		m			0.28	
Wiggler length		m			1.72	
Number of wigglers					44	
Total length of wiggler		m			75.68	
Overvoltage			1.7	1.7	1.7	1.6
RF voltage		MV	7.5	7.5	10.4	13.4
Number of RF cavities			6	12	9	12
Power per cavity		kW	293	292	269	273
Voltage per cavity		MV	1.25	0.63	1.16	1.12
Klystrons per ring			2	4	3	4
Power per klystron		kW	880	880	807	820

based on Guiducci presentations from BAW-2 and ALCPG'11



DTC lattice parameters options

Significant change from previous slide

Parameter	10 Hz(Low)	5 Hz (Low)	5 Hz (High)
Circumference	3.2 km	3.2 km	3.2 km
τ_x/τ_y [ms]	13.5	24.1	24.1
σ_δ	0.134%	0.11%	0.11%
$\nu\epsilon_v$ [μm]	2.7	4.4	4.4
ξ_x/ξ_y	-51.5/-44.6	-51.5/-43.9	-51.5/-43.9
Energy loss/turn [MeV]	8.0	4.5	4.5
Power/RF coupler @400mA [kW]	200	112.5	225



RF Parameters

- **For design work (remainder TDR) focus on 12 cavities solution**
 - lumi upgrade
 - 10Hz operation
- **Final cost (and parameter!) adjustments to be made in October**
 - Likely we will downgrade cavity/klystron count to support only 1312 bunches
 - scale cost accordingly
 - Additional cavities/klystrons for 2625 bunches will be added during upgrade.
- **CFS baseline must include support for upgrade in initial construction**
 - Large tunnel
 - Mechanical / electrical CF



CFS Criteria

- **Initial estimates have been made**
 - Based on 'high power' requirement ring, three rings?
 - criteria / drawings in EDMS
- **Outstanding: power/cooling requirements for DC bus solution**
 - First estimate mid-August (meeting at FNAL)
 - AC power distribution (alcoves) needs review
- **CFS civil cost by end of July 2011**
- **Second iteration (review) Jan/Feb 2012**
 - scale requirements/costs as required



Costs

- **Nearly everything by October 2011**
- **Vacuum system early 2012**
 - depends on availability of KEK-B estimates/numbers
- **Magnets – based on existing models**
 - assume the bores remain the same as in RDR
 - supports?
- **DC bus system**
 - Conceptual estimate exists for 6km ring
 - Need help from P. Bellomo to update
- **Instrumentation – addition of vacuum will change**
- **RF costs – needs review of unit estimates!**



e⁺ longitudinal acceptance

	Baseline	Luminosity update	10 Hz mode
Train rep. rate	5 Hz	5 Hz	10 Hz
Number of bunches/train	1300	2600	1300
Number of particles/bunch	2×10^{10}		
e ⁺ max. transverse amplitude $A_x + A_y$	0.09 m.rad		
e ⁺ max. energy error δ_{\max}	$\pm 0.5\%$		
e ⁺ max bunch length	± 34 mm		
e ⁻ normalized injected emittance	45 μm		
e ⁻ rms relative injected energy spread	0.1%		

From RDR
Check with positron
source