# **RICH CONSTRUCTION & OPERATION PLANS**

Contalbrigo Marco INFN Ferrara

Rich Technical Review, 27th June 2013

# 12 GeV Upgrade Project Schedule



# Hall B Upgrade Baseline Schedule

Activity Name	FY 13				FY 14			FY 15			FY 16				FY 17					
-	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	
Critical Decisions									4A (	þ	4B <	Þ				46	Revi	ised		
		celera hutdo																		
Accelerator including Civil																				
Hall B																				╞
					 						•									
De-install CLAS																				
Space Frame Modification																				Í
Modify Forward Carriage					I															
Install PCAL		ĺ			Þ		İ		İ	ĺ	İ			ĺ	1					
Install FTOF 1a/1b							1				İ		İ	İ	ĺ	1		İ		
Install LTCC		1			İ		1		1		İ		İ	İ	İ	1	İ	İ		İ
Install FTOF 2a																				
Cryo Distribution Installation																				
Delivery First Torus Cold Mass						٠														
Delivery Last Torus Cold Mass							•	•									1			
Delivery First Torus Cryostat							<b>♦</b>													
Delivery Last Torus Cryostat								•	•											
Assembly of the TORUS in the Hall								1	1	-	1									
Install Wire Chambers																				
Install HTCC																				
Delivery Solenoid								•	>											
Install Solenoid											•									
Install Central Detector																mo	nth	S		
Beam														F				┝		
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											Procu	Ireme	ent &	Assei	mble					
											Inst	allatio	n & C	heck	out					
											Bea	im Co	mmis	sioni	ng					
						1	1	1	1	1	1	1	1	1	1	1				

# **RICH Project Goal**

1<sup>st</sup> sector ready for physics run in 2016



## 1<sup>st</sup> RICH Sector Time Schedule

TASK	2013 1 <sup>st</sup> h	2013 2 <sup>nd</sup> h	2014 1 <sup>st</sup> h	2014 2 <sup>nd</sup> h	2015 1 <sup>st</sup> h	2015 2 <sup>nd</sup> h	2016 1 <sup>st</sup> h	Institutions
Prototype test	X	X						ALL
Simulations & recon. software	X	X	X	X	X			DU+INFN+ANL +UCONN
TDR	X	X						ALL
Procurement and test aerogel		X	x	X	X	x	x	INFN+JLAB
R&D electronics	X	X	X	X				INFN+JLAB
Procurement & test electronics			X	X	X	x		INFN+JLAB+UTFSM
Procurement & test MA-PMTs		X	x	X	X	x		JLAB+INFN+GU+MIP
Mechanics			x	X	x	x		INFN+JLAB
R&D Mirrors	Х	X	X					INFN+JLAB
Mirrors				X	X	x	X	INFN+JLAB
Services (gas system, slow control,)			X	X	X	X		
<b>RICH assembly</b>						X	Х	ALL

### **Commissioning & Calibration**

Use Electron Signals for comission and calibration:

Mimic pion signal (almost saturated at 4-5 GeV/c) Alignment (i.e. with drift-chambers and among mirrors) Aerogel refractive index map Mirror aberration corrections Tune of the patter-recognition and reconstruction algorithms Efficiency and mis-identification probability

Use meson and hyperon decays to validate RICH performances:

- K<sub>s</sub> for pions
- $\phi$  for kaons
- $\Lambda$  for protons

Use no-track events:

Dark counts Pedestal calibration & Common noise subtraction

### Operation

#### Gas system:

• Dry atmosphere for the hydrophilic aerogel preservation

#### **Slow Control:**

- HV and LV power supply monitor
- RICH stability monitor (i.e. on pedestals, occupancy, basic signals like high-energy electrons)

#### Computer farm:

Off-line event reconstruction

### Conclusions

#### Interference with CLAS12:

- Designed to fit into the LTCC clearance
- No impact on the downstream detector performances

#### **RICH Operation:**

- Use physics triggers for commissioning and calibration
- Use well-known maximum-likelihood methods to reconstruct the not-trivial Cherenkov signal pattern

#### **Project Schedule:**

 2 ½ years is a challenging time anyway feasible within the 14 months contingency