



# **WP6a Master Plan, Key Milestones**

## **Functional requirements**

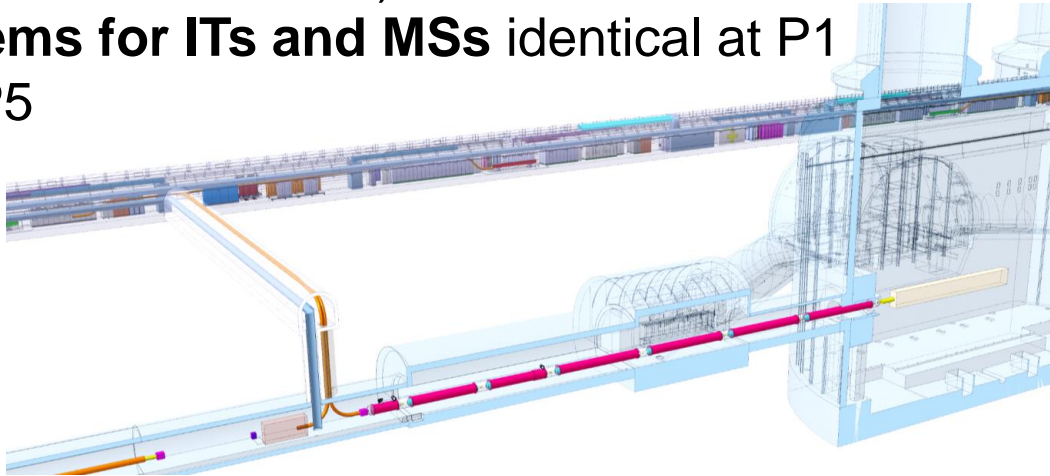
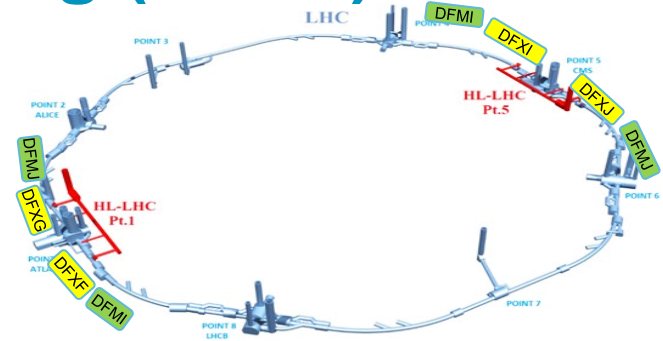
## **DFX Within WP6a System**



DFX Conceptual Design Review, CERN, 31/01/2019

# The HL-LHC Cold Powering (WP6a)

- **Four Cold Powering Systems**
- **Two different types** of Cold Powering Systems (one for the Triplets and one for the Matching Sections (D2 and its correctors))
- **Systems for ITs and MSs** identical at P1 and P5

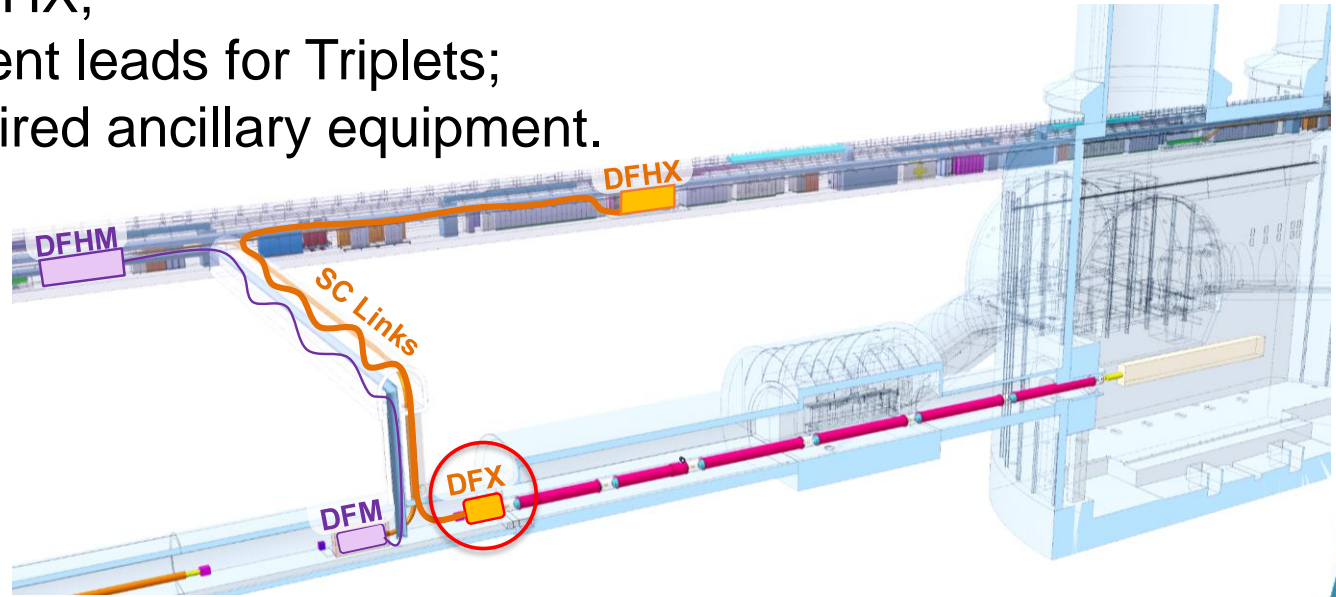


Focus of this review is on the systems powering the Triplets

# The HL-LHC Cold Powering (WP6a)

## Cold powering system for HL-LHC Triplets:

- One SC Link;
- One DFX;
- One DFHX;
- All current leads for Triplets;
- All required ancillary equipment.



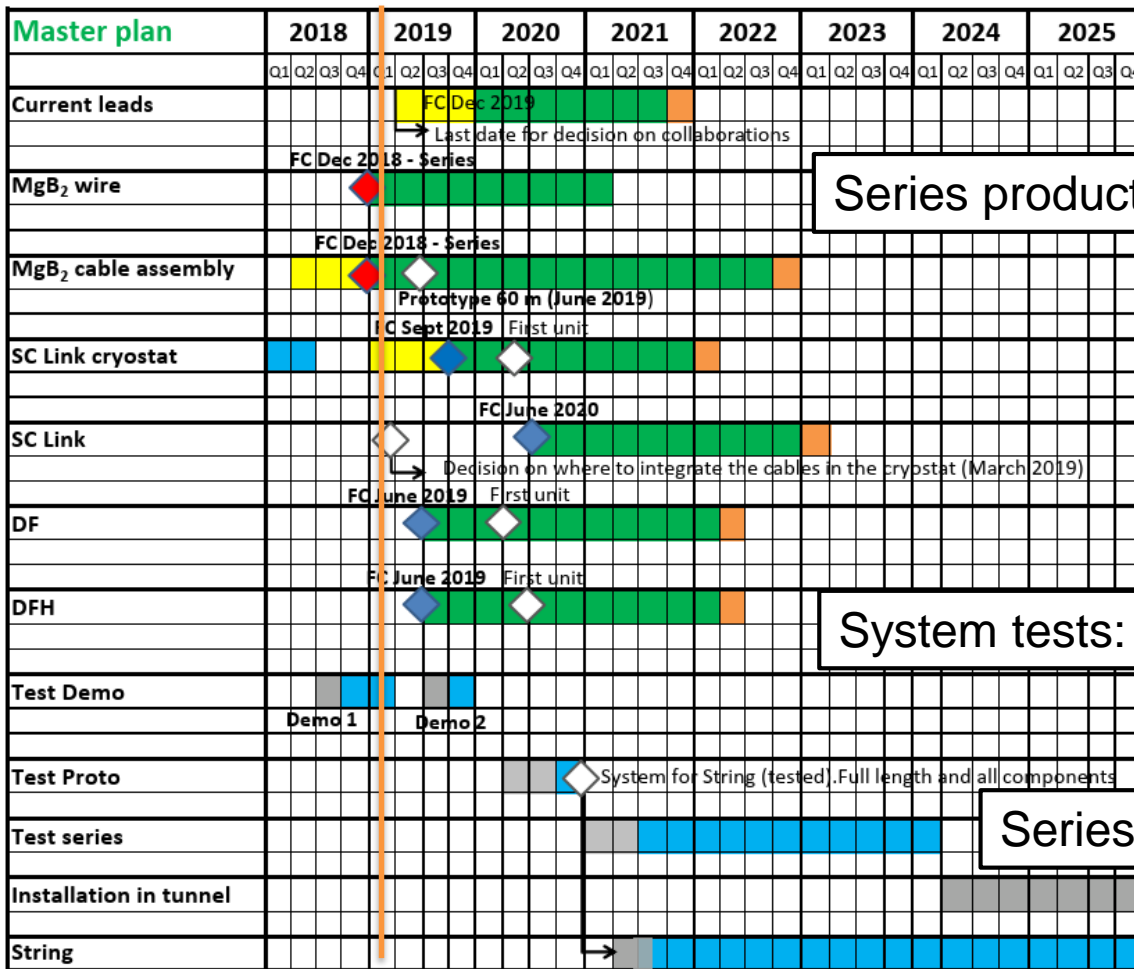
# HL-LHC Triplets

EDMS 1821907

	Magnet	Cold Powering			
	$I_{ult}$ (kA)	$I_{peak}$ (kA)	$I_{lead}$ (kA)	$I_{cable}$ (kA)	$N_{leads}/N_{cables}$
MQXF	17.82	-	18	18	2
Trim Q1	2	2.4	2*	7	1
Q2a/Q2b	Protec.	5.6	2*	7	1
Trim Q3	2	6.8	2*	7	1
MCBXFB	1.73	-	2	2	2+2
MCBXFB	1.59	-	2	2	2+2
MCBXFA	1.73	-	2	2	2
MCBXFA	1.59	-	2	2	2
D1	12.96	-	18	18	2

4× 18 kA  
3× 7 kA  
12 × 2 kA

# WP6a Master Plan



Series production: 2019-2021

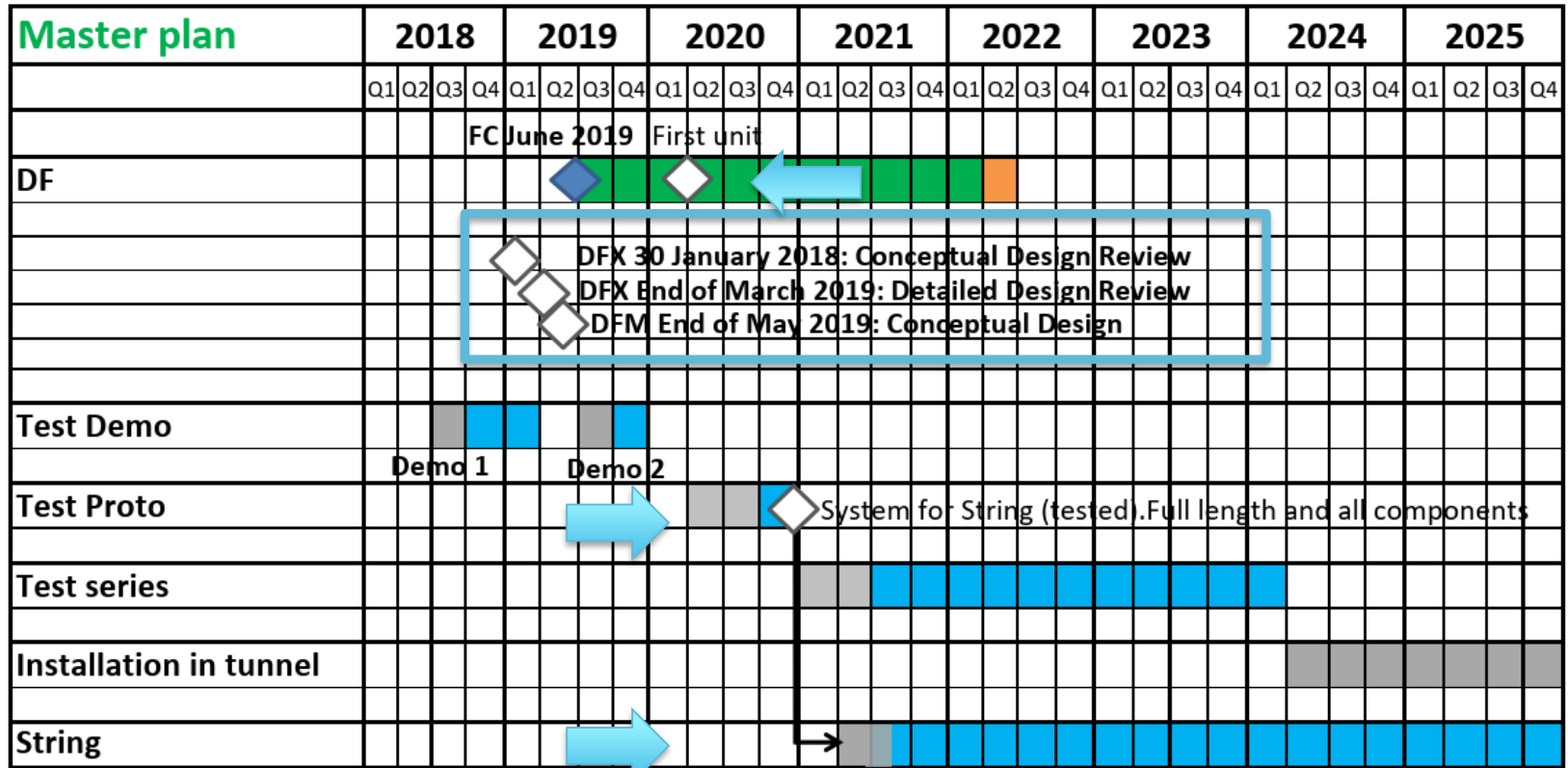
System tests: 2018-2020

Series tests: 2021- 2023

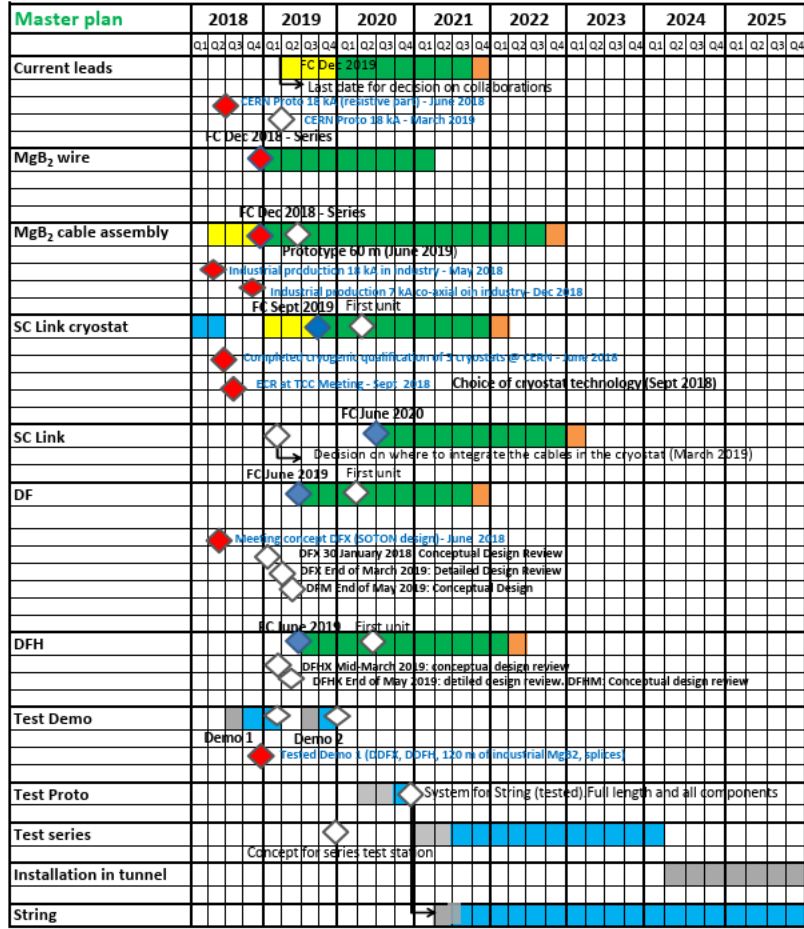
- Tendering
- Manufacturing
- Tests
- Installation
- Spares
- Achieved milestone
- Future milestone
- FC dates



# DFX in WP6a Master Plan



# WP6a Key Milestones



Full-scale CERN proto 18 kA REBCO lead – March 2019

Series procurement MgB<sub>2</sub>– FC **Dec 2018**

Series Cabling MgB<sub>2</sub> – FC **Dec 2018**

SC Link Cryostat technology (2-walls) – **Sept 2018**  
Series SC Link Cryostat procurement – FC September 2019

Series SC Link assembly– FC Sept 2019

Prototype DFX – March 2019  
Series DFX/DFM – FC June 2019

Prototype DFH – June 2020  
Series DFH – FC June 2019

Demo 1 – **Dec. 2018**/ March 2019. Demo 2 – Dec. 2019

Prototype System – Dec. 2020

Series Test – June. 2021

String – June. 2021

# DFX Functional Requirements

Interface to SC Link (mechanical, electrical)

Space requirements for SC Link

MgB<sub>2</sub> to Nb-Ti splices

Accessibility

Nb-Ti tail (attached to SC Link) feasibility





***Thank you !***

