

# ***Documentation status***

## ***MQYY-M Short model quadrupole***

*CERN, 6<sup>th</sup> July 2017*

*A. Foussat, (TE MSC-LMF)*

*Acknowledgement to J L, Asencio Riquelme QA HL-LHC*



# MQYY-M Documentation structure

- *MQYY-M engineering* completed by CEA, objective to issue **MQYY-M Technical Engineering report** by **Dec 2017 (CEA)**
- **Built-to-Print specification drawings** reviewed as produced, archived to EDMS for CERN procurement of components, late CDD archive at the end of production;
- *No specific MQYYM technical specification* but *Prototype Functional specification (PCP)* approved;
- *Records of Meetings* :
  - Minutes of working CEA-CERN meetings and presentations on [Indico MQYY WP3 page](#).
  - New EDMS subfolders **to be used for official meeting records**
- *Equipment code* definition done : [Link 1](#), [Equipment Portal](#)
- *Manufacture dossier*:
  - **CERN MTF structure proposal** under work to be finalized based on CEA PBS and assembly steps – **Oct 2017 (QA HL-LHC)**
  - First assembly procedures and inspection records to be archived in EDMS from **Dec 2017 (CEA)**
- Test plan shall be issued from **Jan 2018**

# MQYY-M EDMS Documentation structure

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Navigator

CERN-0000162229 Public access  
Functional drawings & models

Q4 Short Model

- Minutes, Presentations and Administrative documents
- Engineering Drafts & Notes
  - Specifications
  - Functional drawings & models
    - 1808451 (v.1) CEA Pole Components
    - 1808457 (v.1) CEA Pole Components Drawings
- Fabrication & Assembly Drafts & Notes
  - Manufacturing drawings
  - Manufacturing procedures
  - Inspection & test procedures
  - Qualifications
  - Manufacturing records
  - Test Drafts & Notes

Info

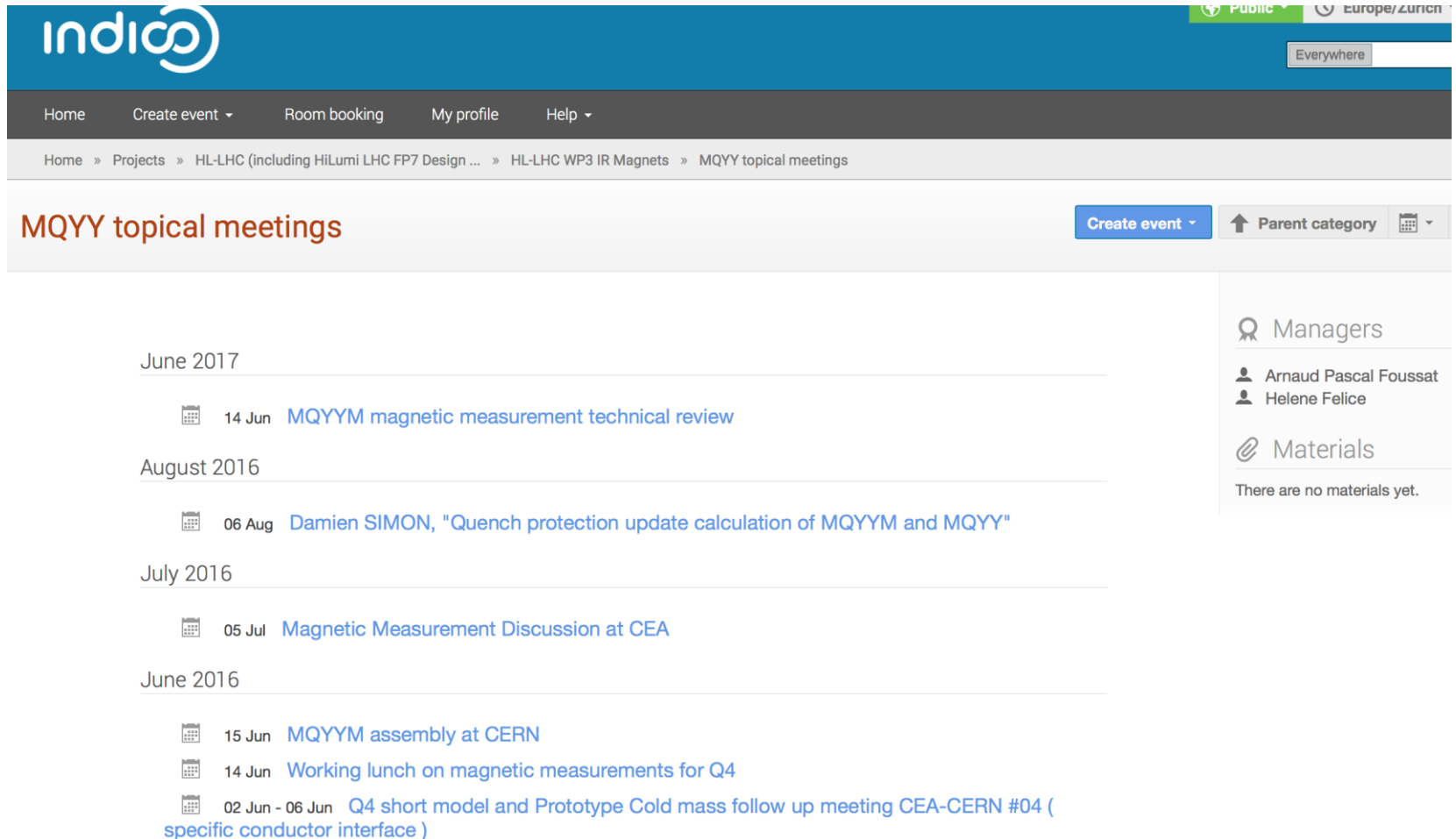
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Documents Structure Used in Access rights History

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#	Id	Title	Files	Status	Created on	Author	Document type
10	1808451 v.1	CEA Pole Components	1	In Work	2017-05-17	Arnaud Pascal Foussi	Note
20	1808457 v.1	CEA Pole Components Drawings		In Work	2017-05-17	JOSE LUIS ASENSIC	Drawing Folder

# MQYY-M Indico topical meetings



The screenshot shows the Indico website interface. At the top, there is a navigation bar with the Indico logo, a search bar containing "Everywhere", and a dropdown menu with "Public" and "Europe/zurich". Below this is a secondary navigation bar with links for "Home", "Create event", "Room booking", "My profile", and "Help". A breadcrumb trail reads: "Home » Projects » HL-LHC (including HiLumi LHC FP7 Design ... » HL-LHC WP3 IR Magnets » MQYY topical meetings".

## MQYY topical meetings

[Create event](#) [Parent category](#) [Calendar](#)

**June 2017**

- 14 Jun [MQYYM magnetic measurement technical review](#)

**August 2016**

- 06 Aug [Damien SIMON, "Quench protection update calculation of MQYYM and MQYY"](#)

**July 2016**

- 05 Jul [Magnetic Measurement Discussion at CEA](#)

**June 2016**

- 15 Jun [MQYYM assembly at CERN](#)
- 14 Jun [Working lunch on magnetic measurements for Q4](#)
- 02 Jun - 06 Jun [Q4 short model and Prototype Cold mass follow up meeting CEA-CERN #04 \(specific conductor interface\)](#)

**Managers**

- Arnaud Pascal Foussat
- Helene Felice

**Materials**

There are no materials yet.

# MQYY-M equipment code

## QUADRUPOLES

Level	JL Eq. Code	Item Description	Category/Item	Own Class	Quantity
	<b>LMQYYM</b>	<b>Cold Mass</b>			1
	LMQYYMS	Shell			1
	LMQYYMS	Cold Mass Support			1
	LMQYYMS	BPM Support			1
	LMQYYMS	Heat exchanger Tube			1
	LMQYYMS	Iron Yoke			1
	LMQYYME	Bus bar			1
	LMQYYME	Splices			batch
	LMQYYMS	End covers			1
	<b>MQYYM</b>	<b>Quadrupole MQM</b>			1
	MQYYMC	Apperture 1			2
	MQYYMC		Coil		8
	MQYYMC		Coil		-
	MQYYMC		Coil		-
	MQYYMC		Coil		-
	MQYYMC			Cable	batch
	MQYYMC			End Spacers	batch
	MQYYMC			Wedges	batch
	MQYYMC	Apperture 2			1
	MQYYMC		Coil		-
	MQYYMC		Coil		-
	MQYYMC		Coil		-
	MQYYMC		Coil		-
	MQYYMC			Cable	batch
	MQYYMC			End Spacers	batch
	MQYYMC			Wedges	batch
	MQYYMC	Collars			1
	DQH	Quench Heater			1
	MQYYMC	Collaring Key (Pins)			1
	MQYYMC	End plates			1

# Proposed MQYY-M / LMQYY product breakdown structure and control points in CERN MTF

## PBS of MQYY-M

Step ID	Step Description																
	<b>Cable</b>		<b>Coil</b>		<b>Wedges</b>		<b>End Spacers</b>		<b>Collar</b>		<b>Quench Heater</b>		<b>Collaring Key (Pins)</b>		<b>End plates</b>		<b>MQYYM</b>
10	Cable insulation	10	Winding coils	10	wedges insulation	10	Reception of asset	10	collars measurement	10	Reception of asset	10	Reception of asset	10	Reception of asset	10	Cold test
20	Dimensional Measurement	20	Dimensional Control	20	Electrical Integrity Test	20	Dimensional Control	20	Collaring	20	Dimensional Control	20	Dimensional Control	20	Dimensional Control	20	Shipping to CERN
30	Electrical Integrity Test	30	Electrical Integrity Test						30	Dimensional Control	30	Wire soldering					
		40	E Modulus measurement						40	Electrical Integrity Test	40	Electric Test					
		50	Internal V -tap Wires Soldering														
		60	Protection heater assembly														

## For further discussion : PBS of LMQYY

	Shell		Cold Mass Support		BPM Support		Heat exchanger Tube		Iron Yoke		Bus Bar		Splice		End Covers		LMQYYM
10	Assembly in shells	10	Metallurgical Report	10	Dimensional Control	10	Dimensional Control	10	Yoke laminations measurement	10	Dimensional Control	10	Splice Box Assembly	10	End Cover Welding	10	Magnets geometrical measurement
20	Longitudinal Welding	20	Dimensional Control			20	Fatigue Test	20	Perform Yoking	20	SC Leads Soldering	20	Inspection of Welding	20	Inspection of Welding	20	Welds Examination
30	Inspection of Welding							30	Removal of mandrel	30	V -tap Wires Soldering	30	Dimensional Control	30	Dimensional Control	30	Cold mass geometrical measurement
40	End-ring Welding							40	Dimensional Control	40	Dimensional Control	40	Alignment, Marking	40	Alignment, Marking	40	Final electrical tests
50	Inspection of Welding							50	Mechanical instrumentation	50	Electrical Integrity Test	50	Electrical Integrity Test	50	Electrical Integrity Test	50	Warm magnetic measurements
60	Applying Axial Force to the Coil											60	Pressure Test	60	Pressure Test	60	Pressure and leak tests
70	Dimensional Measurement											70	Documents for Pressure Codes	70	Documents for Pressure Codes		
80	Alignment, Marking																
90	Holes Welding																
100	Dimensional Measurement																
110	Electrical Integrity Test																
120	Documents for Pressure Codes																

Note: Similar proposed PBS structure and control points in prototype QUACO MTF.

# MQYY-M MTF manufacture steps proposal

Step ID	Step Description
<b>10</b>	<b>Cable insulation</b>
<b>20</b>	<b>wedges insulation</b>
<b>100</b>	<b>Winding coils</b>
110	Dimensional Measurement
120	Electrical Integrity Test
130	E Modulus measurement
140	internal V -tap Wires Soldering
150	Protection heater assembly
<b>200</b>	<b>Collared Coil</b>
<b>205</b>	<b>collars measurement</b>
210	Collaring
215	Dimensional Measurement
220	Electrical Integrity Test
<b>300</b>	<b>Yoke Assembly</b>
310	yoke laminations measurement
320	Perform Yoking
320	Removal of mandrel
330	Dimensional Measurement
340	Mechanical instrumentation
<b>400</b>	<b>inter pole Splicing</b>
410	Electrical Integrity Test
<b>500</b>	<b>Structure assembly</b>
<b>600</b>	<b>Cold test</b>
<b>700</b>	<b>Shipping to CERN</b>

<b>800</b>	<b><u>COLD MASS</u></b>
805	<b>Shell Welding</b>
810	Assembly in shells
815	longitudinal Welding
820	Inspection of Welding
825	End-ring Welding
830	Inspection of Welding
835	Applying Axial Force to the Coil
840	Dimensional Measurement
845	Alignment, Marking
850	Holes Welding
855	Dimensional Measurement
860	Electrical Integrity Test
865	Documents for Pressure Codes
<b>1000</b>	<b>Splice Work</b>
1010	Splice Box Assembly
1020	SC Leads Soldering
1030	V -tap Wires Soldering
1040	Dimensional Measurement
1050	Electrical Integrity Test
<b>1100</b>	<b>End Cover welding</b>
1110	End Cover Welding
1120	Inspection of Welding
1130	Dimensional Measurement
1140	Alignment, Marking
1150	Electrical Integrity Test
1160	Pressure Test
1170	Documents for Pressure Codes

CM for MQYY series (maybe one prototype ?)

# MQYY prototype EDMS documentation structure QUACO PCP Project

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**Navigator**

- QUACO Management and administration
  - Minutes
  - Presentations
  - Confidential Documents
  - QUACO Templates
  - Memorandums, letters, fax and other communications
  - Information received from the EU Officer
  - QUACO WPs
  - QUACO Deliverables & Milestones
  - QUACO Requests from Tender Documentation from Firms (Phase 1)
  - QUACO Requests from Tender Documentation from Firms (Phase 2)
  - QUACO-EU Reviews
  - Project Proposal, Grant agreement and consortium agreement
  - QUACO Documentation from Phase 1 (Firms)
    - QUACO Documents provided by the Consortium (Phase 1)
      - OPERA
      - Drawings\_STEP
      - ROXIE
      - Input on mechanics
      - Specifications
        - 1744130 (v.1.1) MQYY Interface Specification
      - Templates for Non-Technical Deliverables
        - 1726180 (v.1) TEMPLATE LICENSE AGREEMENT ROXIE SOFTWARE
        - 1726301 (v.1) Link to the ROXIE SOFTWARE page
        - 1732097 (v.1) Project schedule
        - 1732097 (v.1.1) Project schedule. Update June 2017
      - QUACO ANTEC (Phase 1)
      - QUACO ELYTT (Phase 1)
      - QUACO SIGMAPHI (Phase 1)
      - QUACO TESLA (Phase 1)

**CERN-0000170649** Restricted access  
**QUACO Documents provided by the Consortium (Phase 1)**


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Documents Structure Used in Access rights History

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#	Id	Title	Status	Created on	Author	Document type
10	1726180 v.1	★ TEMPLATE LICENSE AGRE...	Released	2016-10-13	M. Ayass	Note
20	1726301 v.1	★ Link to the ROXIE SOFTWA...	Released	2016-10-13	S. Izquierdo	Procedure
30	1732097 v.1	★ Project schedule	Released	2016-11-09	OUTI KIRSIKK	Note
30	1732097 v.1.1	1 Project schedule. Update Jun...	In Work	2017-06-06	OUTI KIRSIKK	Note
80	1744130 v.1	★ MQYY Interface Specification	Cancelled	2016-12-19	HECTOR GAF	Note
80	1744130 v.1.0	1 1st Draft of MQYY Interface	Obsolete	2016-12-21	HECTOR GAF	Note

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For information, on going MQYY design engineering folders in WORK



# Example of product based MTF

- HCLMQMC010-CR000631 - Helium Vessel
    - HCMQMLS001-TE000016 - Quadrupole MQML
      - HCMQMLS002-TE000031 - Collared coil
        - HCMQMLS003-TE000142 - Coil
          - HCDSC4\_000-VA000132 - SC Cable Type 4
        - HCMQMLS003-TE000143 - Coil
        - HCMQMLS003-TE000144 - Coil
        - HCMQMLS003-TE000145 - Coil
      - HCMQM\_SL20-CO000213 - Quench Heater for MQML
      - HCMQM\_SL20-CO000214 - Quench Heater for MQML
      - HCMQM\_SL20-CO000218 - Quench Heater for MQML
      - HCMQM\_SL20-CO000222 - Quench Heater for MQML
      - HCMQM\_SL20-CO000223 - Quench Heater for MQML
      - HCMQM\_SL20-CO000237 - Quench Heater for MQML
      - HCMQM\_SL20-CO000238 - Quench Heater for MQML
      - HCMQM\_SL20-CO000240 - Quench Heater for MQML
    - HCMQMLS002-TE000032 - Collared coil
  - HCMCBCA001-TE000032 - MCBCA Magnet Assembly
  - HCQITESCXT-CR023670 - Cryo Thermometer
  - HCQBBIK001-BA000367 - Flexible K-long
  - HCQBBIK001-BA000398 - Flexible K-long (v1)
  - HCQSQ820-CZ000084 - Cool Line C' - BPM with sensors - SSS Arc
  - HCVCMQD009-IN000002 - Ass. BPM / Beam Screen L-Type:Outer Rin
  - HCVSS\_033-BA000184 - SSS V1 Pumping Hose Assembly
  - HCVSS\_034-BA000576 - SSS V2 Pumping Hose Assembly
  - HCVCMQD010-IN000002 - Ass. BPM / Beam Screen L-Type:Inner Rin
  - HCVSSB\_883-BI000213 - SSS Downstream (outer) (V1)
  - HCVSSBM001-SK000547 - SSS Nested Bellow (V1)
  - HCVSSBM001-SK000615 - SSS Nested Bellow
  - HCBPM\_F025-MG000326 - Arc BPM Cryogenic Cables HCBPM\_F025

## Equipment Folder : Main Info

**Equipment Identifier:** HCLMQMC001-CR000631  
**Other Identifier:** LMQMC631  
**Description:** Cold Mass LMQMC

Main	Made of	Equipment data	Manufacturing	Operation	Documents	History	Map
<b>Actions:</b> <a href="#">View summary</a>							
<b>Physical</b>							
<b>Manufacturer</b>	CERN						
<b>Resp. Technique</b>							
<b>Status</b>	Manufacturing						
<b>Other Identifier</b>	LMQMC631						
<b>Parent Equipment</b>	<a href="#">HCLQNC001-CR000631</a>						
<b>Parent Slot</b>							
<b>Location</b>	<b>R42</b>						
<b>State</b>	Good						<b>MRC M01</b>
<b>Safety</b>							
<b>RP Classification</b>							
<b>Comments</b>							
<b>Design</b>							
<b>Item in ABS</b>	▶ Cold Mass LMQMC (ver.0)						
<b>Audit</b>							
<b>Created on</b>	2001-01-01	<b>by</b>	HPRIN				
<b>Last modified on</b>	2017-06-02	<b>by</b>	TKRASTEV				
<b>EDMS owner</b>	HPRIN	<b>EDMS group</b>	AT-MEL-ML-LMQ				