MTF – Manufacturing and Test Folder

Large Scale Deployment of MTF

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on behalf of the EDMS Team, TS-CSE

MTF – Manufacturing and Test Folder

Agenda

- Manufacturing follow-up with MTF
- MTF in the installation phase
- Scaling-up of the service

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MTF Scope

- MTF is the tool for manufacturing and installation follow-up within the LHC project:
  - It contains today the descriptions of more than 120.000 equipment: mainly magnet, QRL and interconnection components
  - It allows traceability of components and follow-up of non-conformities
  - It allows an integrated information flow:
    - status of tests, manufacturing and assembly operations
    - access to the related documents
  - Contains links to external databases: LHC reference database, cables, magnetic measurements etc
- It is an integral part of CERN's Engineering and Equipment Management System (EDMS)
- MTF is based on a commercial product – MP5 of DataStream – and is using Oracle+Web technology

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MTF

EDMS Web

MTF- Travellers

EDMS Common Layer

Axalant
Design data
Drawings & Documents

MP5
Asset tracking
Work management

Other DBs
Parameters
Production data

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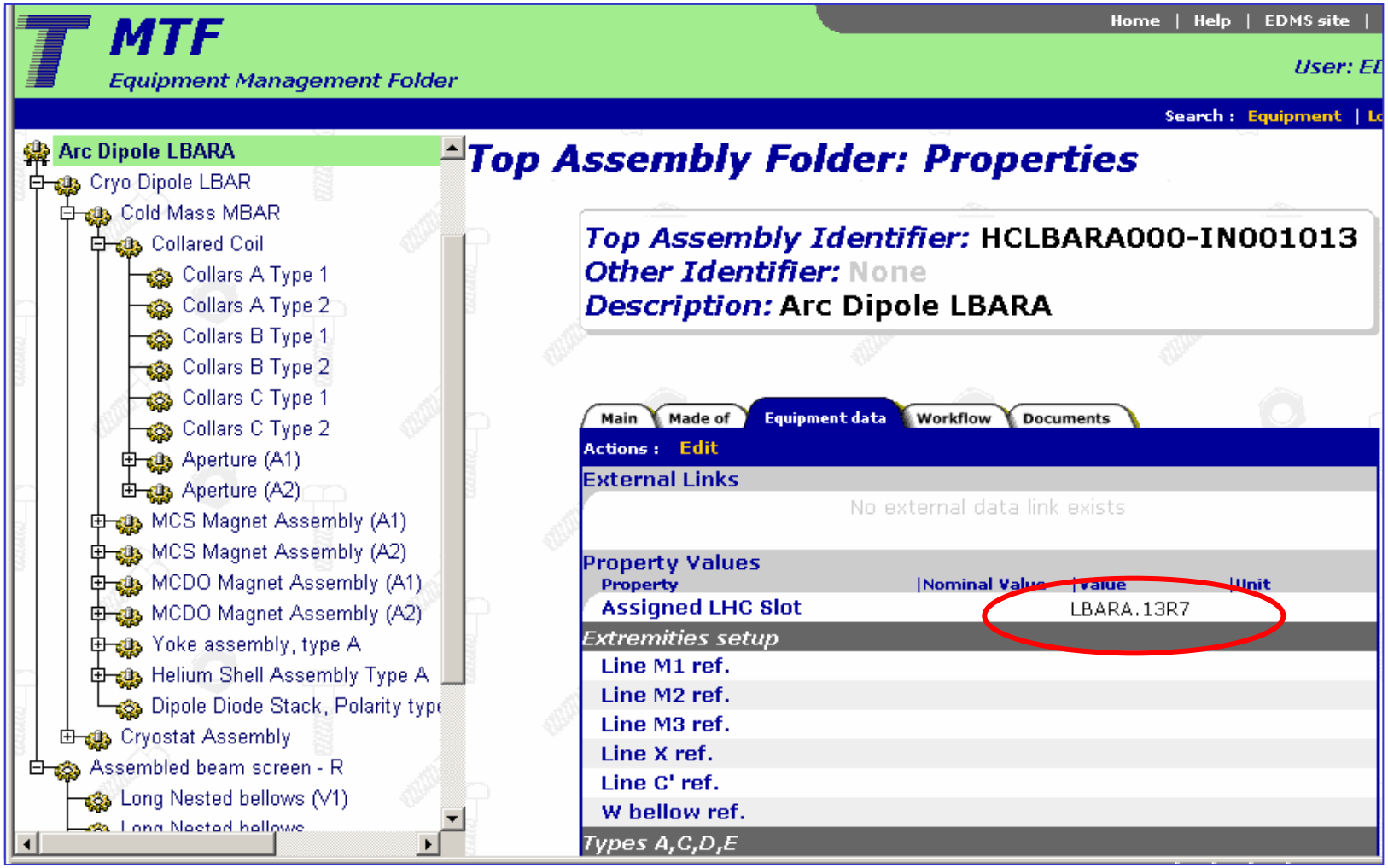
A dipole in MTF



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Assigned LHC slots for Cryo Dipoles

Equipment Id	Slot Id
HCLBARA000-IN001013	LBARA.13R7
HCLBARA000-IN001014	LBARA.12R7
HCLBARA000-IN003006	LBARA.18R7
HCLBARA000-IN003007	LBARA.22R7
HCLBARA000-IN003054	LBARA.20R7
HCLBARA000-IN003055	LBARA.17R7
HCLBARB000-IN003043	LBARB.20R7
HCLBBRA000-IN001008	LBBRA.16R7
HCLBBRA000-IN001009	LBBRA.15R7
HCLBBRA000-IN001021	LBBRA.18R7
HCLBBRA000-IN002008	LBBRA.17R7
HCLBBRA000-IN003041	LBBRA.13R7
HCLBBRB000-IN001031	LBBRB.8R7
HCLBBRC000-IN001035	LBBRC.17R7
HCLBBRC000-IN002009	LBBRC.19R7
HCLBBRC000-IN003011	LBBRC.13R7
HCLBBRD000-IN003034	LBBRD.12L8

17 reserved slots found.

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Tracking of non-conformities

- Procedure for reporting of non-conformities and follow-up of corrective actions: LHC-PM-QA-0611.

Magnet Id	NCR	Equipment	Workflow Step
HCMBALA001-01000090	462362 (ver.1) Initiated QN-1090-CDW1-1	HCLBAL_000-IN001090 Cryo Dipole LBAL	CDW1 Warm Electrical Tests
HCMBALA001-01000090	461610 (ver.1) NC Check LHC-MB-QN-IN-01090-WP02-CRY-01	HCQBACA101-IN001090 Cryostat Assembly	WP02 Cryostat Assembly and relevant tests
HCMBALA001-01000090	434327 (ver.1) Closed NCR_04LHCA120	HCMBA_A101-01000090 Yoke assembly, type A	
HCMBALA001-01000090	374312 (ver.1) Closed NCR 009-03 Flange item 10 (h11). From n? 1 to 52	HCQBAVV101-FC000057 Vacuum Vessel	Dimensional Check
HCMBALA001-01000090	408184 (ver.1) Closed Charpy test at 0ºC for HCQBAVV101-FC000001 to FC000238	HCQBAVV101-FC000057 Vacuum Vessel	Dimensional Check
HCMBALA001-01000090	408187 (ver.1) Closed DImension out of tolerances at points 75 and 4 of the Dimensional Control for HCQBAVV101-FC000057	HCQBAVV101-FC000057 Vacuum Vessel	Dimensional Check
HCMBALA001-01000090	374310 (ver.1) Closed NCR 007-03 with FCM O-rings	HCQBAVV101-FC000057 Vacuum Vessel	Vacuum Leak Check

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Tracking of non-conformities

- Example: Comments on corrective actions.

✓ Jean-Philippe TOCK on 2004-02-17, 08:40 said: Accept ✓
OK after line N is put in conformity

– Jos VLOGAERT on 2004-02-17, 09:10 said: Seen –
ok

✓ Marta BAJKO on 2004-02-17, 09:29 said: Accept ✓
Regarding the tolerances of the shape: the actual tolerance is not anymore applied in the industry on the radial deviation but separatelly in the vertical and horizontal plane. Vertically is +/-0.85mm and +/-1.5mm horizontaly.
At WP08 (in MTF) the vertical shape has its max. error of 0.74mm for the 0.75mm tolerance and the horizontal less than 1mm.
Regardin the N line: on WP01(MTF) the dimension of 310mm was within the tolerance of +/-2mm and after WP08 the end cover moved max. 0.3mm horizontally on the Lyra side and only on the lyra side, which is not explaining the dimension of 315mm.

– Patrick LEPEULE on 2004-02-17, 12:03 said: Seen –
OK for vac components integration. Comment/proposal: would it be possible to bring back the 2 "out of tolerance" points within the race track tolerance with a dedicated alignment from extremities?

– Dominique MISSIAEN on 2004-02-23, 10:01 said: Seen –
I don't agree with the comment of Marta telling us that the tolerance of hor. and vert are completely decoupled. This is not what was decided in the WGA. We will continue opening NC when the r_body values will exceed 0.75 mm as decided by WGA. This value is also useb by MEB

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Reporting, e-mail notifications

Equipment Id	Step Description	Result	Completion Date	Test Report	NCRs
HCLBAR_000-CR001013	Transportation SMA18-Prevessin	Ok	2003-09-02	404465 (ver.1)	
HCLBBR_000-CR001006	Transportation SMA18-Prevessin	Not Ok	2003-09-08		402691 (ver.1) Closed LHC-MB-QN-CR-01006-TRANS-01
HCLBBR_000-IN001035	Transportation SMA18-Prevessin	Ok	2003-09-09	404425 (ver.1)	
HCLBBR_000-IN002008	Transportation SMA18-Prevessin	Ok	2003-09-17	404469 (ver.1)	
HCLBBR_000-IN002009	Transportation SMA18-Prevessin	Ok	2003-09-24		
HCLBBR_000-CR001023	Transportation SMA18-Prevessin	Ok	2003-09-29	406845 (ver.1)	
HCLBBR_000-CR001004	Transportation SMA18-Prevessin	Ok	2003-10-13	408589 (ver.1)	
HCLBBR_000-CR001024	Transportation SMA18-Prevessin	Ok	2003-10-14	408610 (ver.1)	

- Closing of a step can trigger e-mail notifications
- Under study – automatic generation of EDH transport requests

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Dear Sirs,

Please be informed that preparation for storage operations of the
cryodipole [HCLBAR_000-IN003028] is completed.

This is an automatic notification sent by the MTF System
upon closing of the step Preparation for Storage by Olivier
Housiaux


For any question, please contact Mailto:cryodip@cern.ch

Best regards,
EDMS Team
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MTF in the installation phase

- First application for installation follow-up: Tracking of non-conformities related to general services (LHC-PM-QA-0612).

Location	NCR document	Doc title	Doc keywords	NCR status	Document description
R12	464329 (ver. 1)	INC Fibre optique R12	critical	Initiated	Terminer tubes fibres optiques aux positions 25780 et 2
RE12	464326 (ver. 1)	INC Fibre Optique RE12	critical	Initiated	Reprendre la dérivation du tube diamètre 40 pour les fibr
RE12	464328 (ver. 1)	INC Telephone rouge RE12	critical	Initiated	Déplacer le téléphone rouge vers l?extérieur de l?alvéole
RI12	450984 (ver. 1)	INC Tuyauterie RI12	critical	Initiated	Vérifier les support de la Warm Recovery Line avec gaba
RI12	450985 (ver. 1)	INC Electricité	use as is	Initiated	Echelle DS prévue initialement sous tuyauterie eau démi
RT12	450998 (ver. 1)	INC Tuyauterie RT12	critical	Initiated	Manque isolation sur Warm Recovery Line (pas de canive
RT12	450999 (ver. 1)	INC Tuyauterie	use as is	Initiated	Tuyauterie incendie sort du sol. Non présent dans modè
RT12	451000 (ver. 1)	INC Electricité	use as is	Initiated	Echelle à cables plus étroite que dans le modèle 3D. Sup
RT12	451001 (ver. 1)	INC Electricité	use as is	Initiated	Pendards d?échelle à cables non conforme au modèle 3D
UJ12	451002 (ver. 1)	INC Cable rayonnant UJ12	critical	Initiated	Manque un cable rayonnant :de coffret de dérivation à
UJ12	451003 (ver. 1)	INC Tuyauterie UJ12	critical	Initiated	Manque isolation sur Warm Recovery Line (pas de canive
UJ12	451004 (ver. 1)	INC Tuyauterie	use as is	Initiated	Dans modèle 3D, manque supports tuyauteries en tête d
UJ12	451005 (ver. 1)	INC Tuyauterie	use as is	Initiated	Des équipements LEP ont été démontés. Ils apparaissen
UJ12	451006 (ver. 1)	INC Electricité	use as is	Initiated	3 coffrets sous échelle à cables (entre échelle et charpe
UJ12	451007 (ver. 1)	INC Electricité	use as is	Initiated	Echelle à cables en tête de voute non conforme au mod

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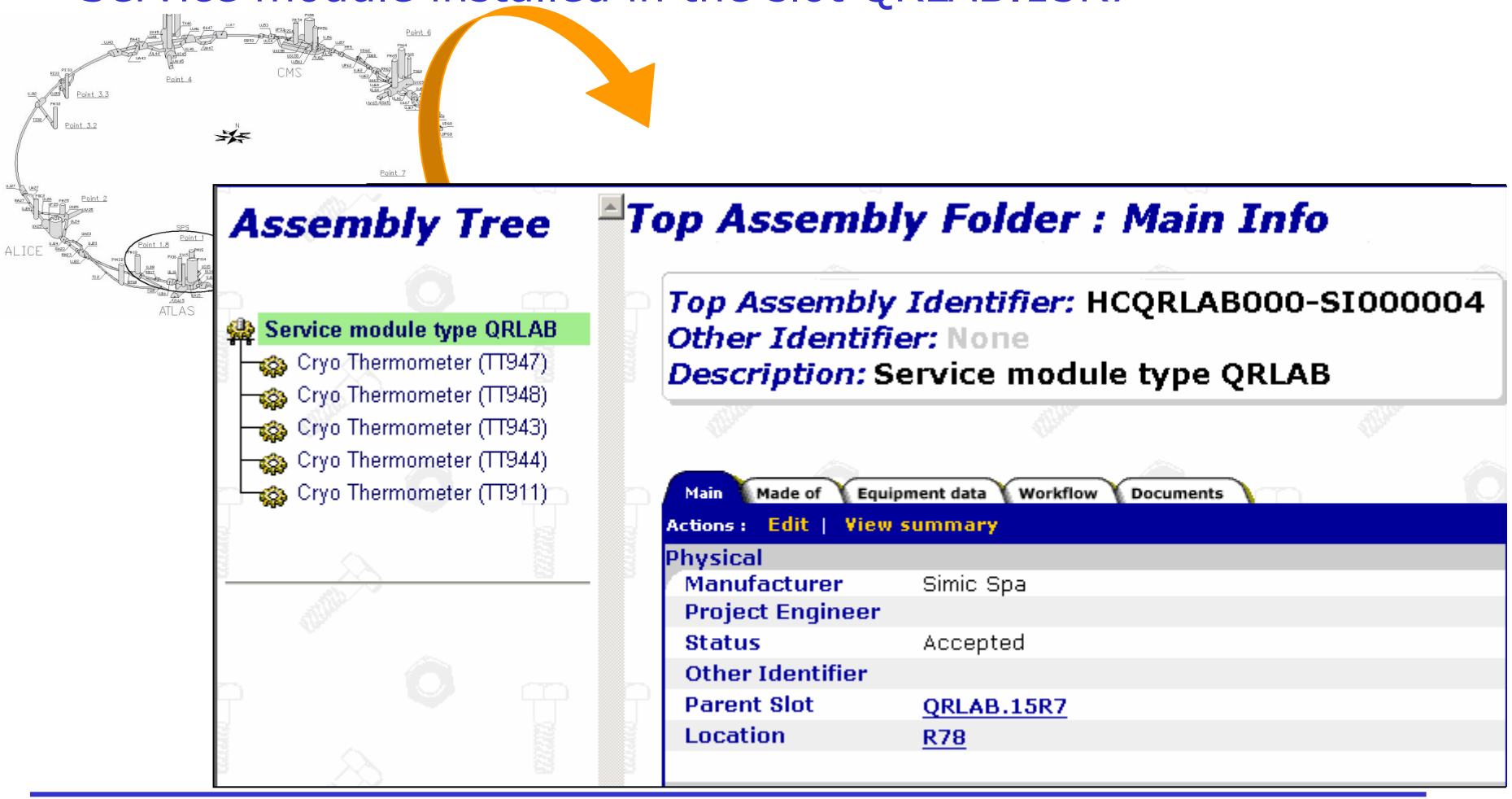
QRL Installation follow-up

- Service module installed in the slot QRLAB.15R7



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Installation of interconnections

- Collection of the data in the tunnel will be done by using the MTF data transfer file:
  - Reporting on completed step
  - Attaching measurement files
  - Referencing used components (already registered in MTF)

- Uploading of data in the MTF database after each working day:
  - Compressing of the MTF transfer file and all related documents
  - Submitting the data to the MTF Import Queue – data will be imported during the night

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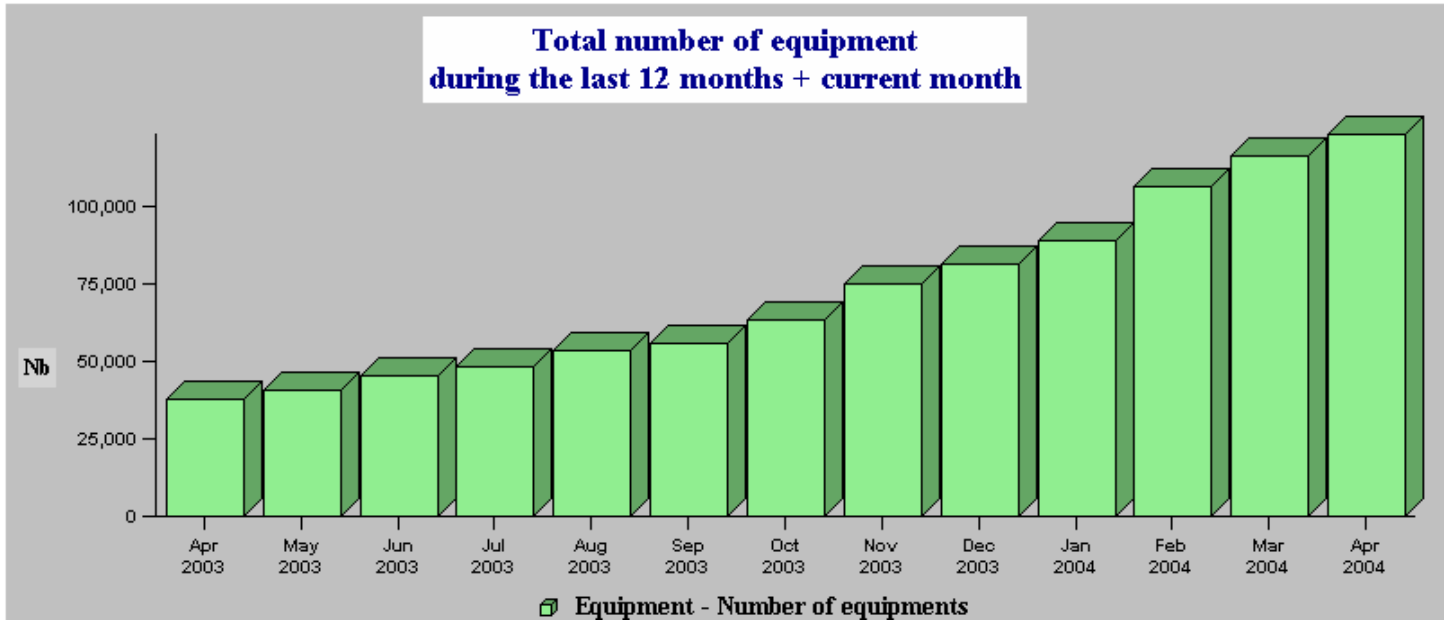
Scaling-up of the service



- Information campaigns and user training
- Promotion of the direct use of MTF Web by suppliers
- New data import mechanism (MICADO – MTF Import Chain to Avoid Data Overdose)

- MTF Workshop:
  - Definition of minimum data required in MTF
  - Procedures to ensure data quality
- Training:
  - 22 half-day sessions, 204 persons trained
  - Good collaboration with CERN Technical Training Service
- Collection of data as close as possible to where it is generated
- LHCQA WG 2004:
  - Reinforcement of the role of LHC quality representatives
  - Review of the QAP implementation group by group

Conclusions

- The large scale deployment of MTF is both an organizational and technical challenge.
- It requires QA coordination and close collaboration between different equipment groups.
- Acquired experience provides a solid basis for new developments of additional system functionality and the formalization of QA procedures.