

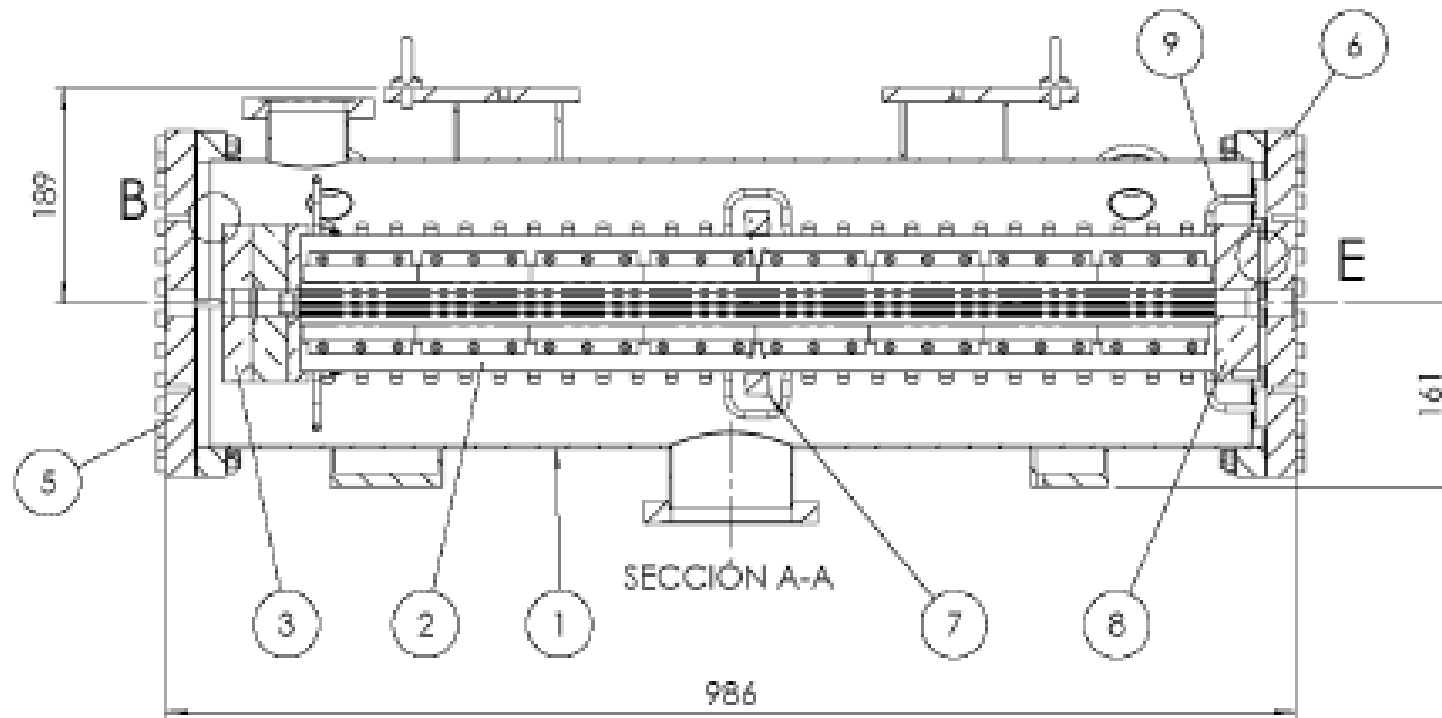
# TBL status and construction strategy

- **Status of components**
- **Installations Plans for shutdown 2008/2009**
- **Perspective for CDR (2010)**
- **Construction Proposal**

# Status of the prototype components

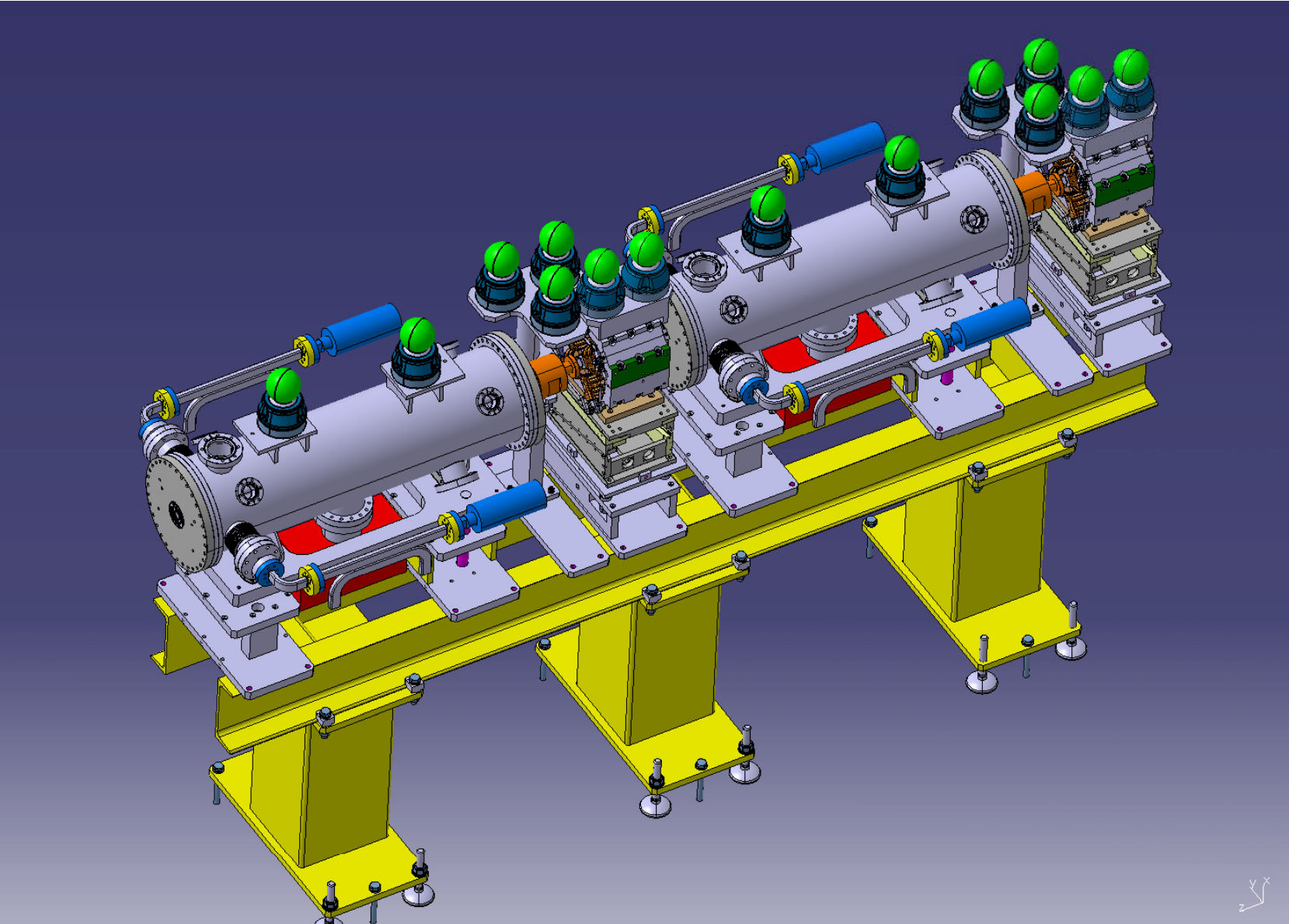
- PETS tank: under fabrication at CIEMAT (End of January)
- BPM's: 2 prototypes finished, one installed under test with beam ringing problem of the electronics' investigated and fixed  
Series: under fabrication (March 2009)
- Quads: Prototypes under assembly at Russia and CERN  
acceptance test this week  
Series fabrication started (February 2009)
- Quad-Movers: Prototype installed and tested,  
Series under fabrication (2 more now, rest later)
- High power rf: directional couplers, loads prototypes  
under fabrication,  
Series: CEA white paper contribution for 8 sets
- Low Level rf: channels for prototypes testing available
- Other Beam diagnostics: defined and under fabrication

# PETS-Tank

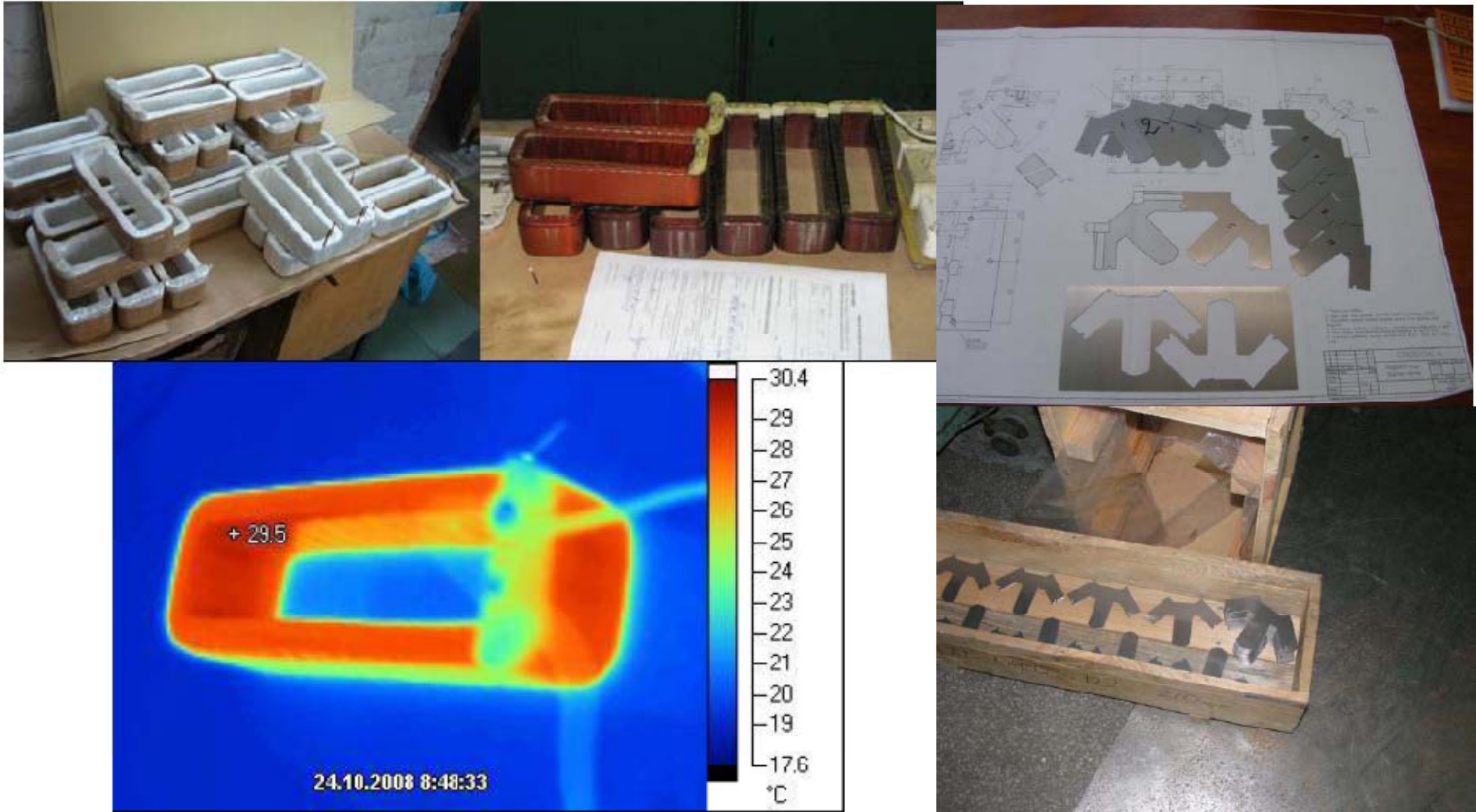


All parts in fabrication, PETS received, test bench ready, tank this year, coupler awaiting brazing

# Tank integration



# Quadrupole production at BINP



Series promised for End of January 2009, acceptance test December 2008

# BPS under beam test

Retested with beam today

First beam with losses,

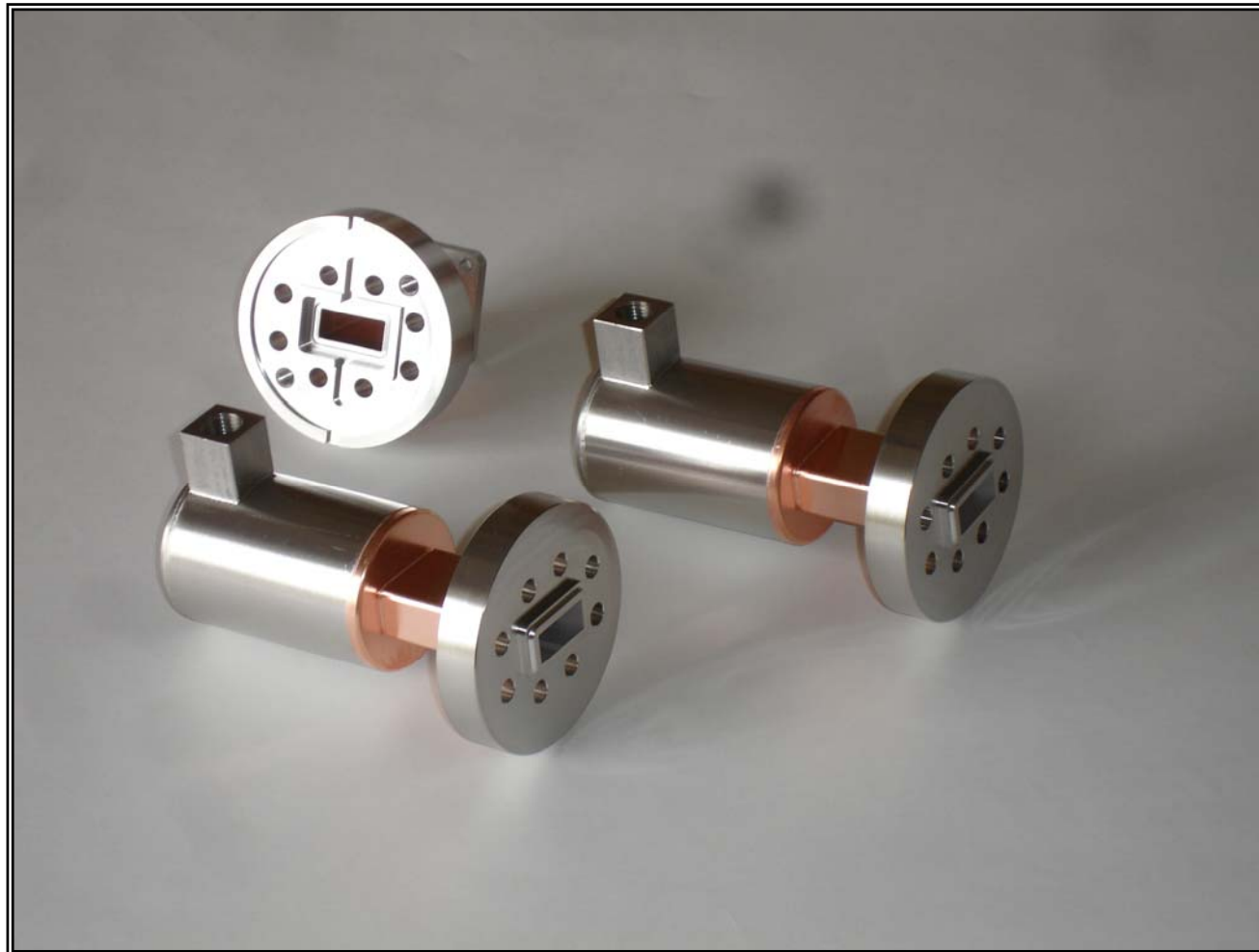
Ringing problem already detected with calibration pulses

Problem has been investigated and solved by the experts

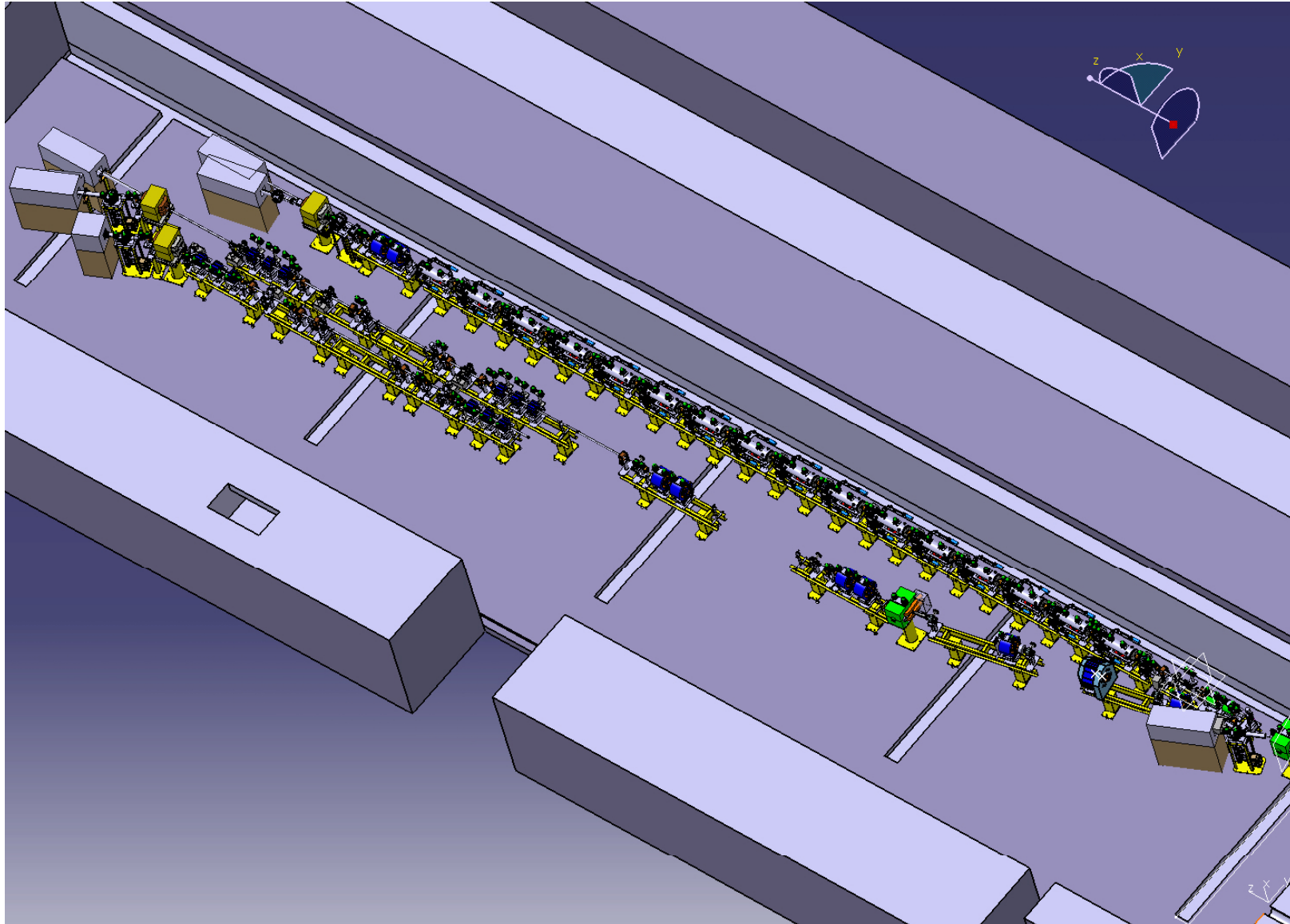


# RF components prototypes, high power load at factory

Water load with disk window, compact and inexpensive  
(Delivery end of the year)

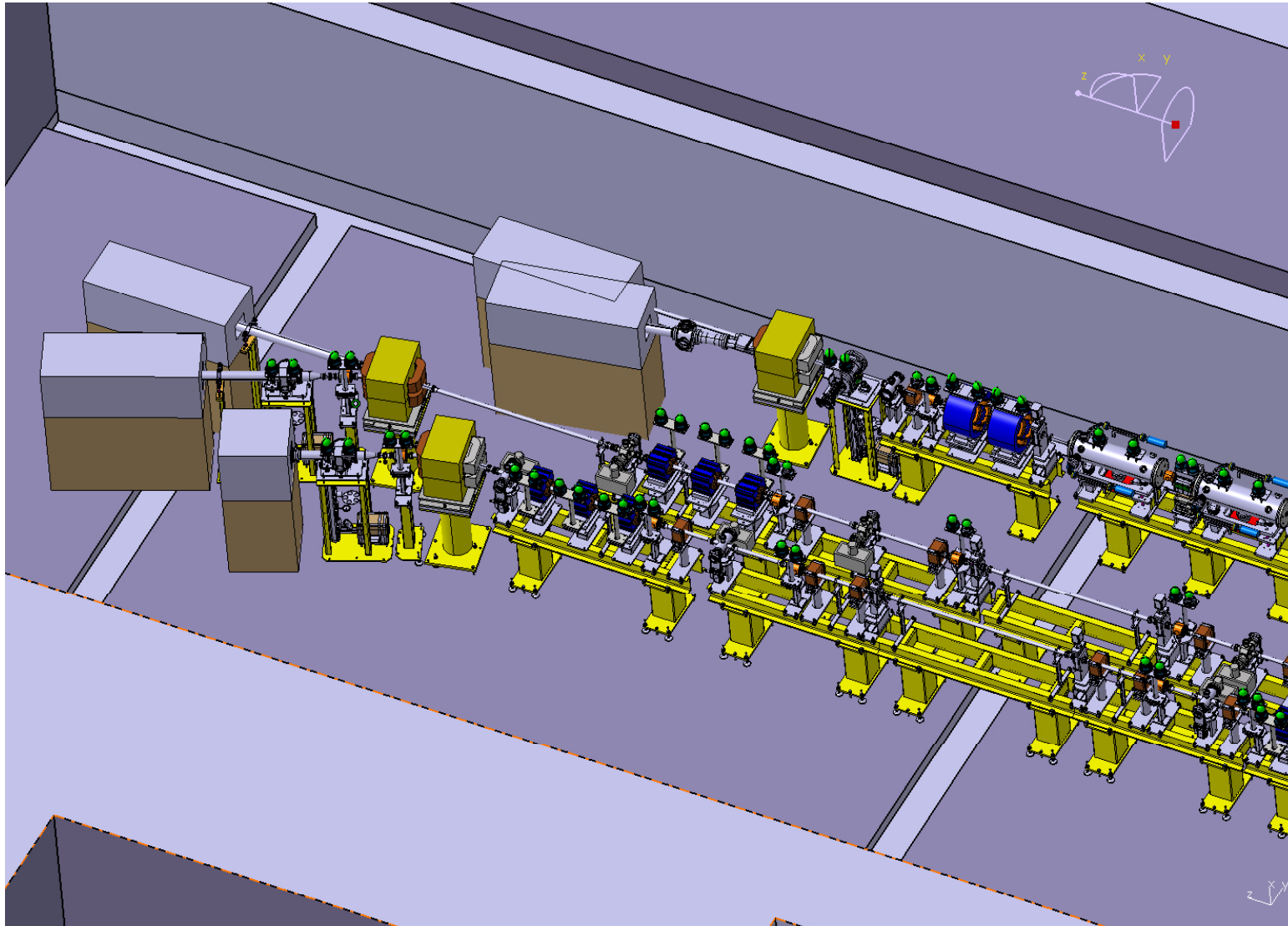


# TBL integration into CLEX





# TBL diagnostic section



# Installation-Schedule

- Install beam line as far as possible, limited by component delivery girders, supports, cabling, prototype PETS-tank if possible Quads, BPS, vacuum system and end of line spectrometer
- We will not have more than one PETS tank and only 3 movers

Task Name	Duration	r.2008			January 2009					February 2009					March 2009				April 2009		
		50	51	52	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	
		08.12	15.12	22.12	29.12	05.01	12.01	19.01	26.01	02.02	09.02	16.02	23.02	02.03	09.03	16.03	23.03	30.03	06.04	13.04	
TBL	1 day																				
Install. Module prototype	1 day																				
Tracage geometres	1.5 days								26.01												
Pose 8 poutres	8 days								27.01												
Deplacement Dump	1 day							07.01													
Tirage de cables ensemble elements	15 days												23.02								
Delivery Q.	1 day												23.02								
Install. 3 Q. + table de reglage mover	2 days												24.02								
Install. 13 Tables de reglage standart	3 days												26.02								
Install. 13 Q.	3 days												03.03								
Install. MTV	3 days												06.03								
Connexion electrique elements	5 days													11.03							
Alignement elements	5 days														18.03						
Install. 16 BPS	5 days															25.03					
Install. Vide	5 days																		01.04		
Install. Electr.BPS- LAPP/Barcelone	10 days																		01.04		

# Goals and Requirements

- o High energy spread beam transport, low losses  
(Bench mark simulations)
- o RF Power Production, Stability  
(End Energy <50%, 2.6 GW of RF power)
- o Alignment  
Active Quad alignment with movers  
(Test procedures for BBA, DFS)  
100 microns pre-alignment for PETS
- o Drive Beam Stability, Wake fields  
(no direct measurement of the wake fields)
- o 'Realistic' show case of a CLIC decelerator
- o Industrialization of complicated RF components

# What about CDR in 2010 ?

- Unlikely to install more than 8 PETS until mid 2010
- Can we define a feasibility result using 8 PETS

8 PETS only

$E_0 = 130 \text{ MeV}$

$I = 28 \text{ A}$

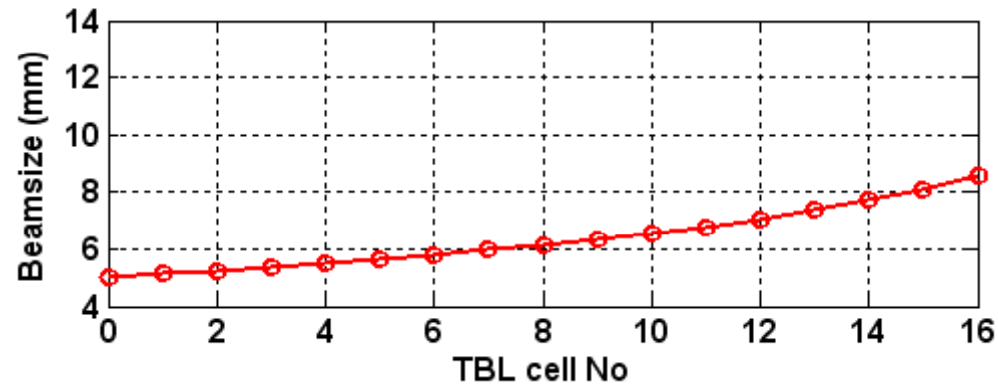
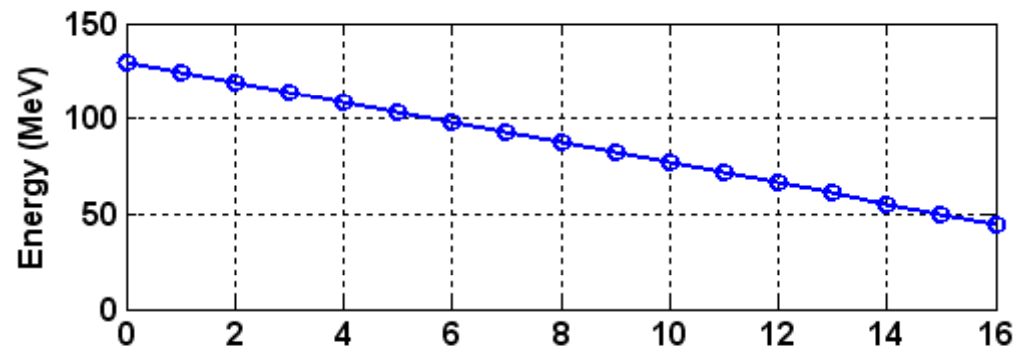
Eff = 33 %  
(was 65% for 16)

1.2 GW of rf power

$E_0 = 100 \text{ MeV}$

$I = 28 \text{ A}$

Eff = 42 %



# 'Advantages' of 8 PETS for CDR and 8 PETS later

- Lower risk, since PETS are not fully verified
- Fabricate the next generation PETS for the second half
  - lower cost
  - better engineering
  - new designs
  - new damping
  - on/off
  - better adapted for two beam acceleration
  - prototypes for new facility ?
- Easier experimentation to start with
- Wakefield with undamped PETS

## Possible production scenario for 8 PETS

1. PETS	CIEMAT	3/2009	no damping
2. PETS	CIEMAT	7/2009	
3. PETS	CIEMAT	12/2009	
4. PETS	CIEMAT	3/2010	
5. PETS	CERN	9/2009	
6. PETS	CERN	12/2009	
7. PETS	CERN	03/2010	
8. PETS	CERN	06/2010	

This has to be discussed in detail with CIEMAT,

CERN should be ready to pay part of CIEMAT's production

Possible contribution from India, Frascati, ....?

CERN could try to use different vendors for the PETS

Has to be started as soon as possible, January 2009

# Conclusions

- TBL construction has started
- Delays a bit everywhere, components, planning, testing, fabrication, but still reasonable given the available resources and complexity
- Beam line installation planned for winter shutdown, second shutdown in summer 2009 to finish up and install more PETS if possible
- Series fabrication for 8 PETS has to be launched early next year without major design changes to meet the 2010 deadline
- Taking away the pressure for the next 8 open up a lot of opportunities to learn more towards CLIC and will make the investment more valuable
- Damping material is still an unknown factor
- Need to commit a significant amount of money in 2009