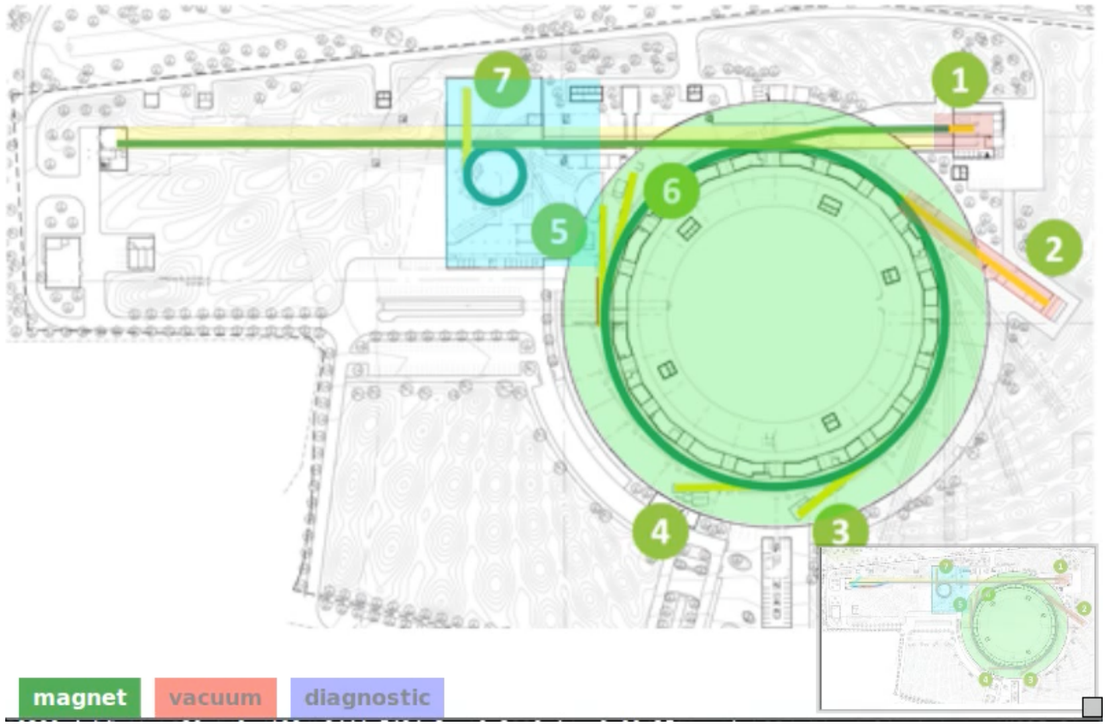
CONTROL SYSTEM STATUS
Tango meeting 2014

Kontrollsystem & IT Services (KITS),
2014/05/19

Current status of MAX IV

	2014				2015				2016			
	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4
I	SubSystem test	commissionning + photogun install			still commissionin g??							
R3					Installation		SubSystem test		Commissionning			
R1						Installation		SubSystem test		Commissionning		
B		Femtomax Optics		Femtomax End Station		Optics 1.1		Optics 1.2	Optics 1.3			

- **Gun**: thermionic being conditioning and photocathode going to be installed in June
- **Injector**: installed, being conditioning, going to be soon in commissioning
- **Ring**: will be installed end of 2014, RF in conditioning, following the subcontractors
- **Beamlines**: 2 beamlines in construction, rings beamlines from spring 2015 to 2016



Lund Karneval 2014


SNAX IV
POPCORNACCELERATOR
MAX IV ett minne blott - SNAX IV blir verklighet

INJECTOR CS

35K control points

13 hosts (Only VM)
195 Server instances
1002 devices
13743 attributes
12932 commands

23 server(s) cannot be checked.

MAX IV

Linac CS

Device Servers

- Hardware layer is operational but the Libera
- Started to implement the Computation Layer (Modulator conditioning, magnet, beamloss …)

GUI

- 7 Specific GUI to help for the conditioning & commissioning
- Synoptic being developed with a new framework

Linac CS

Services:

- Archiving and Snapshot with MySQL deployed and being configured, Archiving Viewer as a main GUI
- Alarm with PyAlarm and others specific tools

Writable State?

Script Environment:

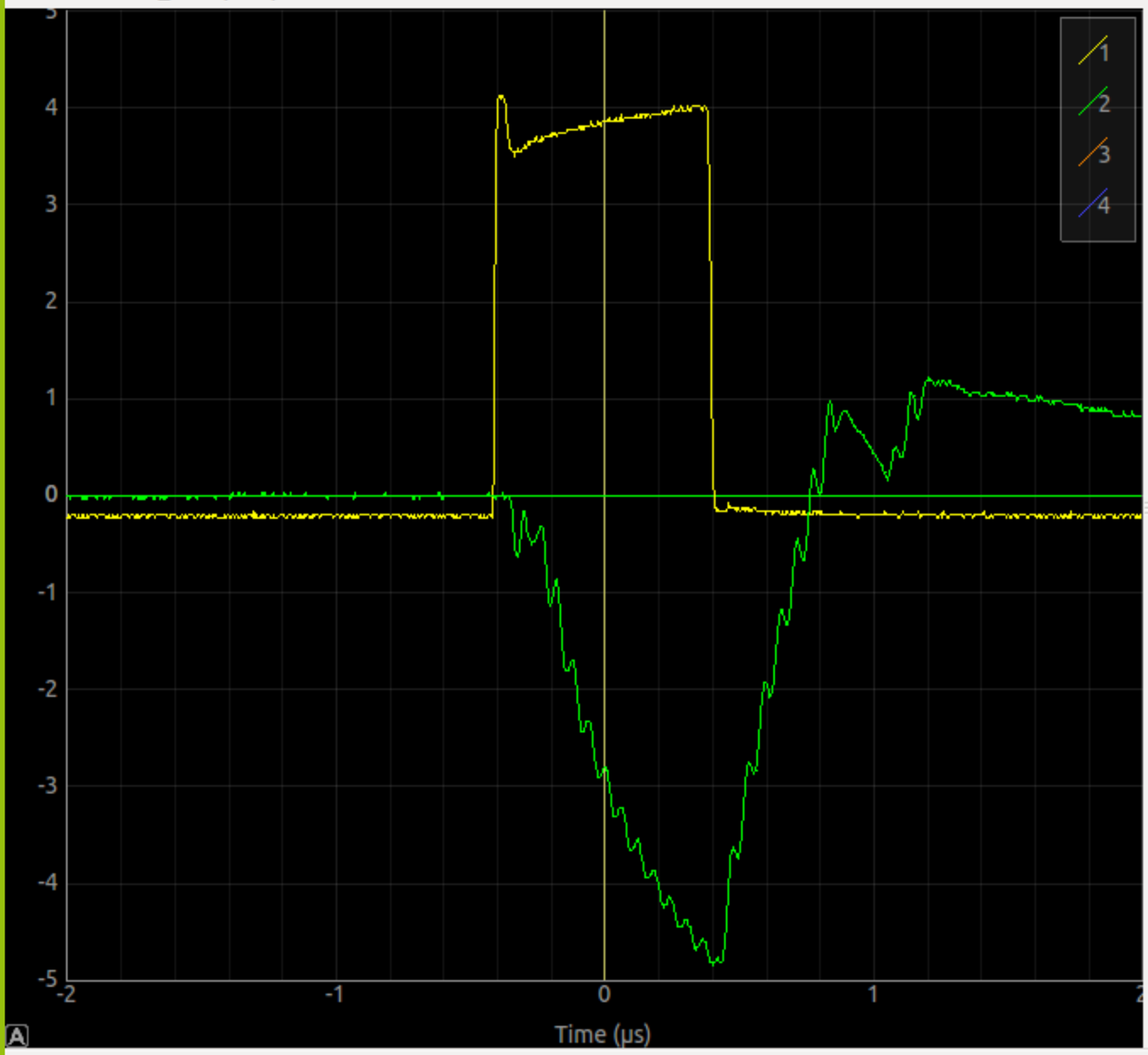
- Python installed by default
- Sardana
- Matlab going to be installed (licence issue)

First Electrons

File View Taurus Tools Panels Help

Load Perspectives

AllWaveforms_I-K00/DIA/OSCA-02



scale_I-K00/DIA/OSCA-02

Position channel 1	-0.220	-0.220
Position channel 2	0.000	0.0
Position channel 3	-1.000	-1.000
Position channel 4	-1.900	-1.900
Vertical range channel 1	0.200	**0.200**
Vertical range channel 2	0.600	0.600
Vertical range channel 3	1.000	1.000
Vertical range channel 4	0.500	0.500
Horizontal (time) range	0.0000	0.0000

Control_I-K00/DIA/OSCA-02

Status

State

Triggered events 625 events

Channel 1 state

Channel 2 state

Channel 3 state

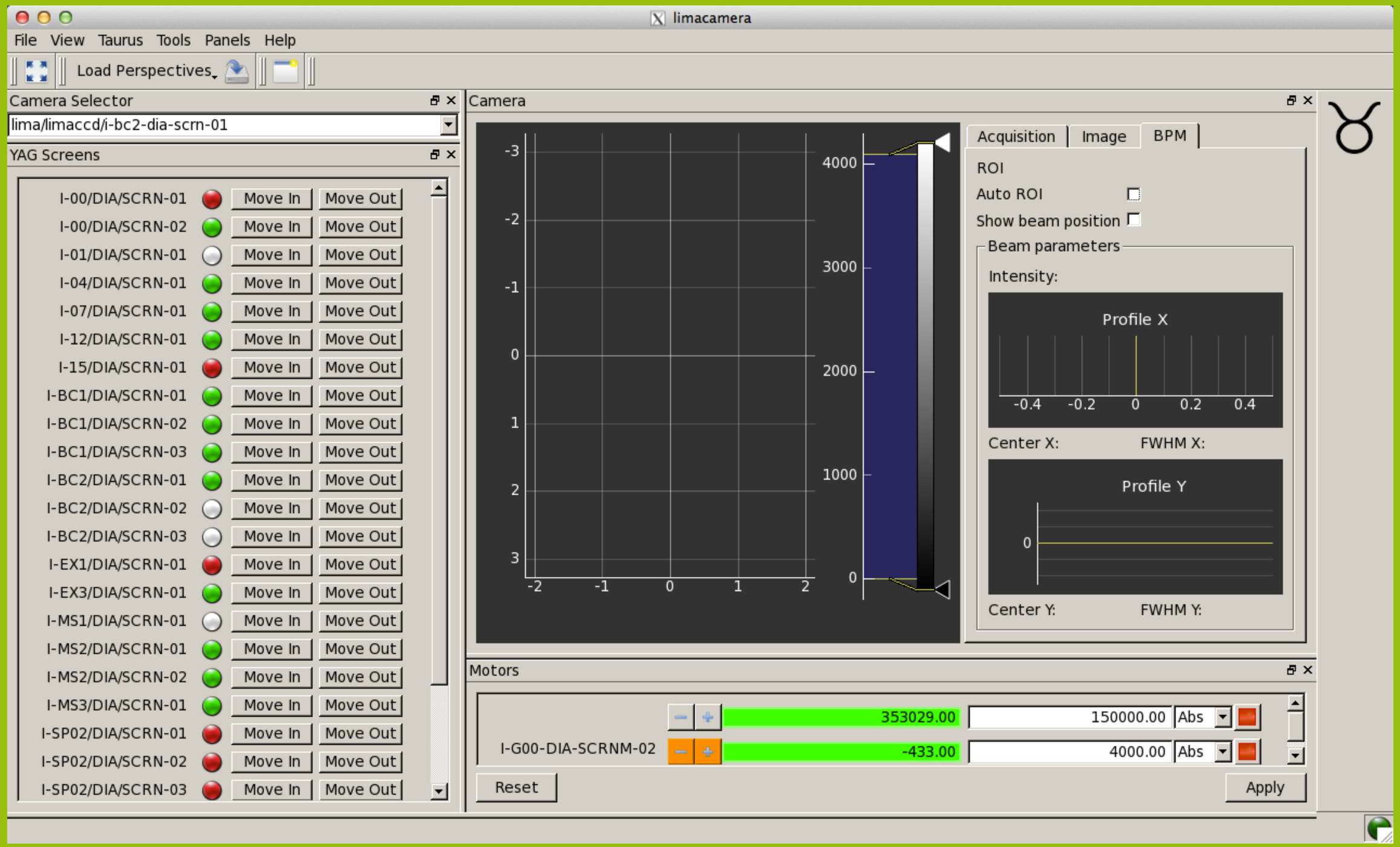
Channel 4 state

Go Local Stop

Channels_I-K00/DIA/OSCA-02

Coupling channel 1	DC	DC
Coupling channel 2	DCL	DCL
Coupling channel 3	DC	DC
Coupling channel 4	DCL	DCL

BeamViewer


limacamera
File View Taurus Tools Panels Help
Load Perspectives
Camera Selector
lima/limaccd/i-bc2-dia-scrn-01
YAG Screens
I-00/DIA/SCRN-01 Move In Move Out
I-00/DIA/SCRN-02 Move In Move Out
I-01/DIA/SCRN-01 Move In Move Out
I-04/DIA/SCRN-01 Move In Move Out
I-07/DIA/SCRN-01 Move In Move Out
I-12/DIA/SCRN-01 Move In Move Out
I-15/DIA/SCRN-01 Move In Move Out
I-BC1/DIA/SCRN-01 Move In Move Out
I-BC1/DIA/SCRN-02 Move In Move Out
I-BC1/DIA/SCRN-03 Move In Move Out
I-BC2/DIA/SCRN-01 Move In Move Out
I-BC2/DIA/SCRN-02 Move In Move Out
I-BC2/DIA/SCRN-03 Move In Move Out
I-EX1/DIA/SCRN-01 Move In Move Out
I-EX3/DIA/SCRN-01 Move In Move Out
I-MS1/DIA/SCRN-01 Move In Move Out
I-MS2/DIA/SCRN-01 Move In Move Out
I-MS2/DIA/SCRN-02 Move In Move Out
I-MS3/DIA/SCRN-01 Move In Move Out
I-SP02/DIA/SCRN-01 Move In Move Out
I-SP02/DIA/SCRN-02 Move In Move Out
I-SP02/DIA/SCRN-03 Move In Move Out
Camera
Acquisition Image BPM
ROI
Auto ROI
Show beam position
Beam parameters
Intensity:
Profile X
Center X: FWHM X:
Profile Y
Center Y: FWHM Y:
Motors
353029.00 150000.00 Abs
I-G00-DIA-SCRNM-02 -433.00 4000.00 Abs
Reset
Apply

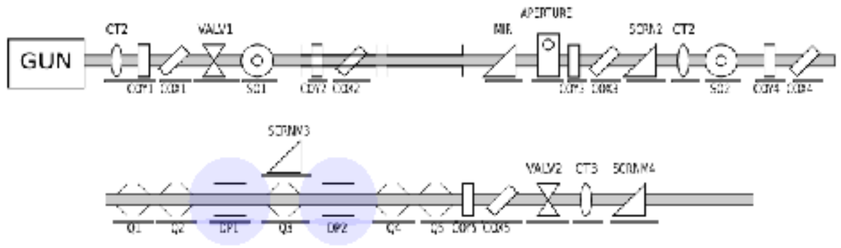
GUN Synoptic

LinacGun

File View Taurus Tools Panels Help

Load Perspectives | gun

gun



Selected Device

I-K00/MAG/PSPC-01

State ON

Attributes | Commands

Capabilities	Show		
DC Current	3.9985	4.0000	A
Impedance	0.00	0.00	Ohm
Interlocked			
MaxCurrent	10.00		A

Communication OK

I-S00-MAG-COFY-02

I-K00/MAG/PSIA-06

State OFF

Attributes | Commands

DC Current	0.0000	0.1000	A
Impedance	1306.66		Ohm
Voltage	0.0083		V

Communication OK

I... I... I... I... I... I... I... I... I... I... I... I... I... I... I...

LinacGun is ready

PSS

MAX IV Personal Saftey System

Modulator Control | Beam Dump Control | SPF Beam Shutter Control | Laser Shutter Control | Magnets | Equipment | Search Overview | Active Alarms | Alarm Log

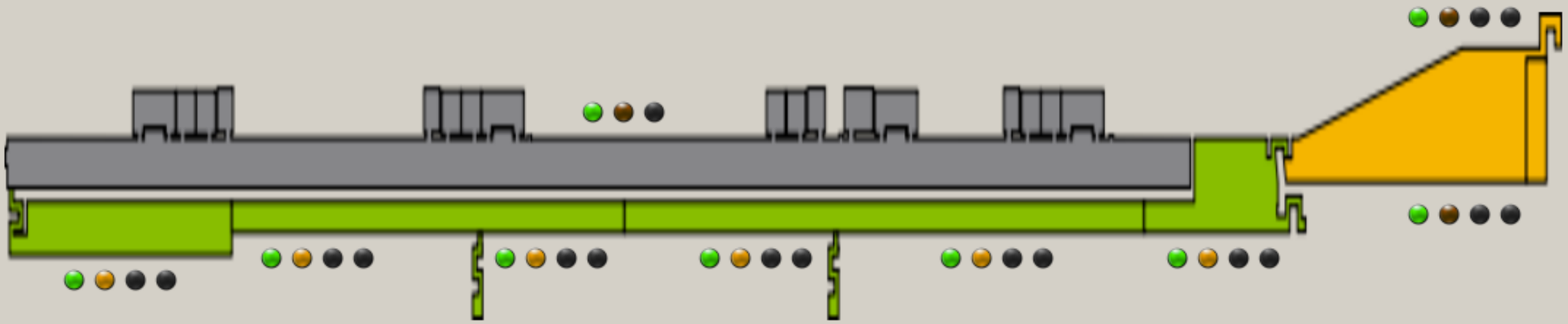
MC Radiation	0
MC Laser	0
L Log State	0
S Log State	1
Laser Bypass Mode	0
LINAC Mode	0

KG

Access	0
Search	0
Step	0
Radiation	0

S1

Access	0
Search	0
Step	0
Radiation	0
Laser	0



L1

Access	0
Search	3
Step	100
Radiation	0
Laser	0

L2

Access	0
Search	3
Step	100
Radiation	0
Laser	0

L5

Access	0
Search	3
Step	100
Radiation	0
Laser	0

L6

Access	0
Search	3
Step	100
Radiation	0
Laser	0

L3

Access	0
Search	3
Step	100
Radiation	0
Laser	0

L4

Access	0
Search	3
Step	100
Radiation	0
Laser	0

S2

Access	0
Search	0
Step	0
Radiation	0
Laser	0

Archiving Viewer

MAX IV - Archive Viewer

- G
- I-GR00
- I-K00
- I-K01
  - RF
    - MOD-01
      - Y2 HvPsVoltage
      - Power

View A Recent Time Period:

5 minutes | 15 minutes | 30 minutes
1 hour | 2 hours | 12 hours
1 day | 2 days | 7 days

Continually Update Above Period Every:

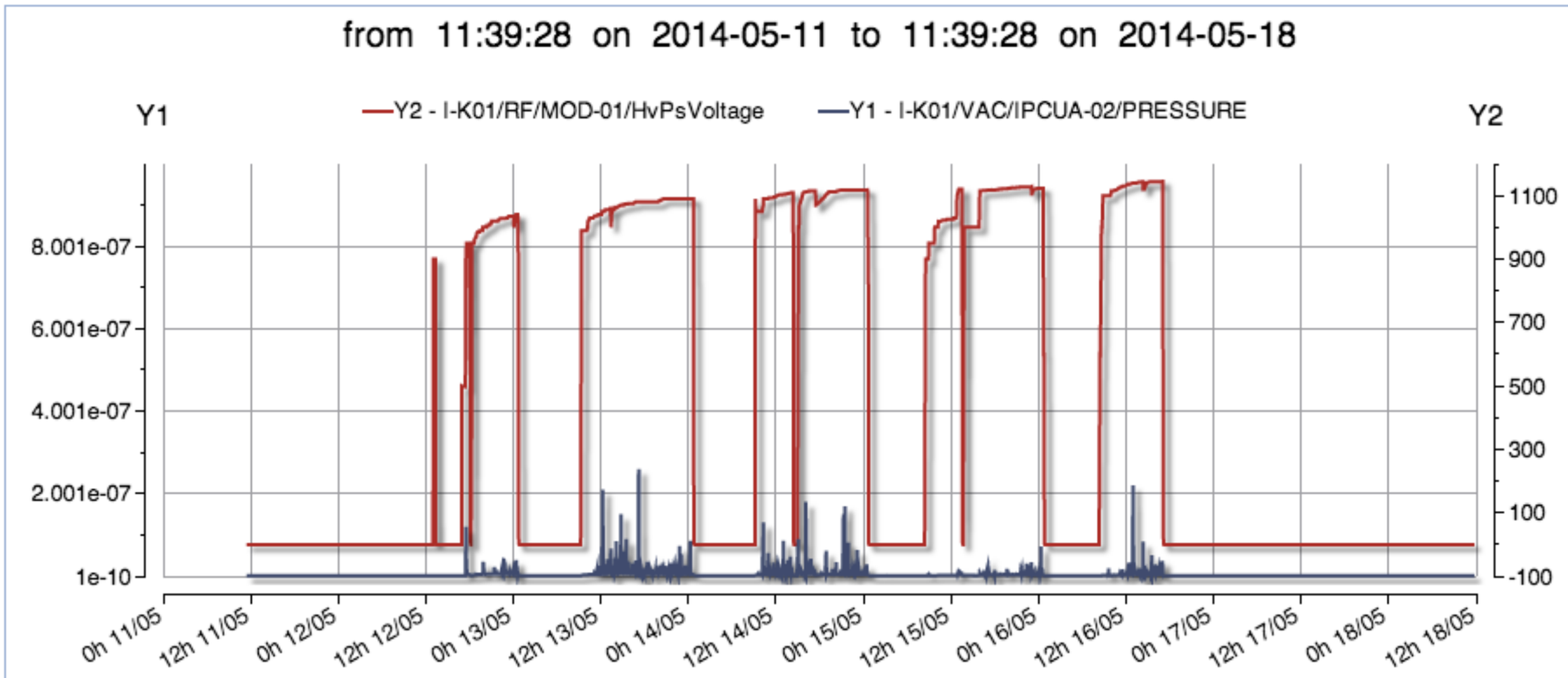
1 second | 10 seconds | stop

Or Choose A Specific Time Period:

start 2014-05-11 11:39:28

stop 2014-05-18 11:39:28

Plot



Axis	Grid	Scale	Set Range	min	max	
X	☑					
Y1	☑	Linear scale	Manual	1e-10	1.0e-6	Go
Y2	☐	Linear scale	Automatic	0.0	1.0	Go

☐ Display values under mouse

Chart Properties | Save Images & Data

Organisation: KITS Team

In the last 7 months during the linac installation and conditioning:

From 1 to 2 Network Enginneers

From 2 to 4 Electronic Engineers

From 4 to 6 Software Engineers and Scientists

Help from:

3 Information management Engineer and Scientists

1 (2 soon) SysAdmin Engineer

2 IT supports

Solaris

And soon Software Consultancy

Project Organisation

Dark Age:

The Control System did not exists 6 months ago.

We pushed the users to use the CS during the installation and the conditioning.

Middle Age:

Now the CS exists in the planning but collect the remaining red path.

We have now a good interface with the Machine physicists with a meeting every 2 weeks.

The software are deeply analysed and receive lot of feedback how it should behave but doesn’t impact the job done ;-)

Technical Organisation

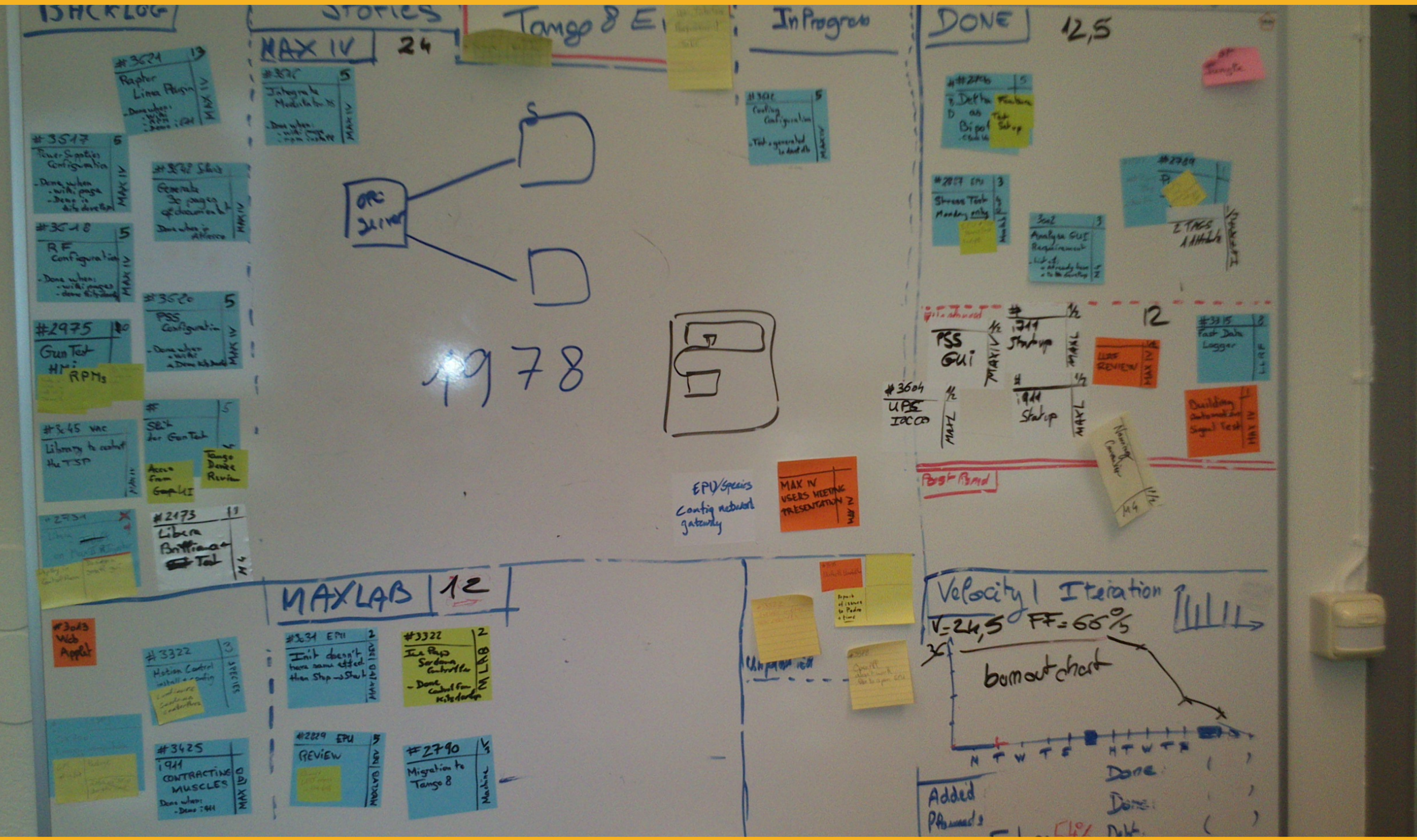
Early adoption of Agile methodologies (Lean, Scrum)

Trained the team to:

- react quickly to the new requirements
- share the work
- iterate short development: react quickly to the feedback
- release and deploy often: basic usage and keep time to develop advance features
- few defect thankful to the automatic Test and the simplicity of implementation

```
def testReset(self):
    expected = 0.0
    for device in self.devices :
        "when :"
        device.Current = .5
        device.Reset()
        actual = device.Current

        "then :"
        self.assertEquals(expected, actual, "
            (expected %s)" % (actual, expecte


def testStateOn(self):
    expected = PyTango.DevState.ON
    for device in self.devices :
        "when:"
        device.On()
        actual = device.state()

        "then:"
        self.assertEquals(expected, actual, "
            after the On command  : %s (expec

def testStateOff(self):
    expected = PyTango.DevState.OFF
    for device in self.devices :
        "when:"
        device.Off()
```

Scrum board


BACKLOG
STORIES
MAX IV 24
Tango 8 E
In Progress
DONE 12,5
MAXLAB 12
1978
PSS GUI
EPU/Specs
Config network gateway
MAX IV USERS MEETING PRESENTATION
Velocity / Iteration
V=24,5 FF=66%
burnout chart
Added
Planned
Done
Done
Debt

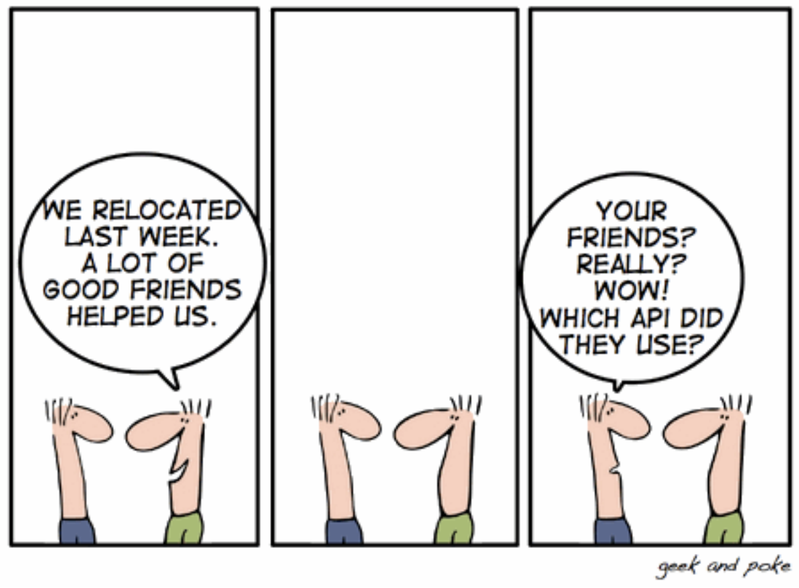
2 steps forwards, 1 step backward

Explain the earliest Agile/Lean to the stakeholders

Agile Tango Tools

Devices: Easy prototyping with dynamic device like PyAttributeProcessor

GUI: Easy development almost on the fly: Taurus GUI



Configuration management for a fast deployment a entire control system:

- DS Generator : tools to configure in large scale Devices, Archiving, Alarm, Snapshot…
- Virtual Machine,
- Ansible,

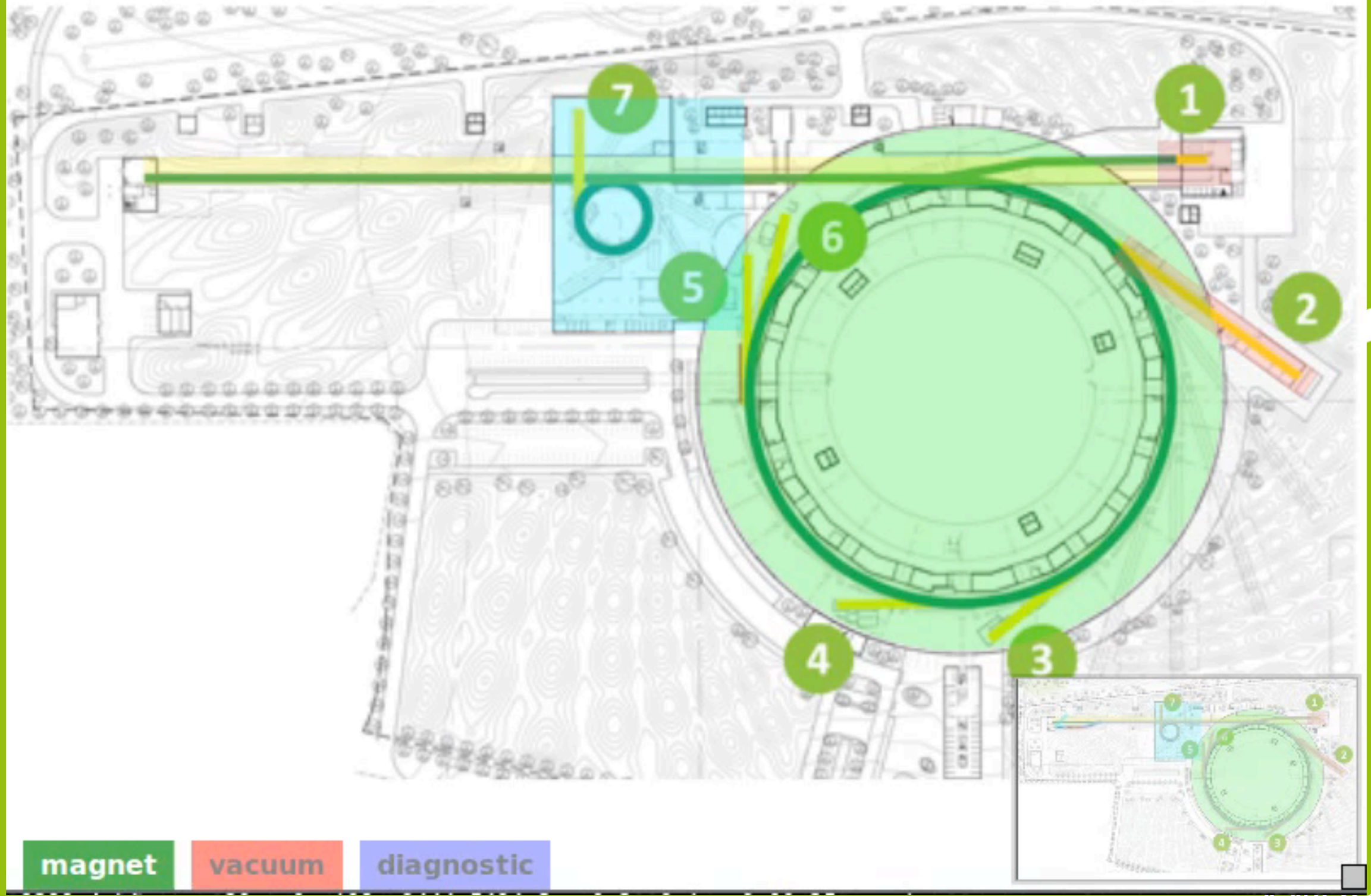
Experience gained

Maximize customer value while minimizing waste

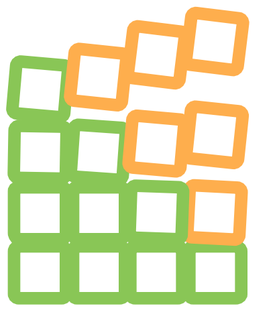
Develop a good and reliable base even if it delays the high level stuff (Special Thanks for FERMI)

Have the right process to be agile: Continuous Deployment, Test, Configuration management

Have the right tools to be agile: Test, TaurusGUI, Configuration Management


7
1
6
5
2
4
3
magnet
vacuum
diagnostic

Credits



QUESTION ?