

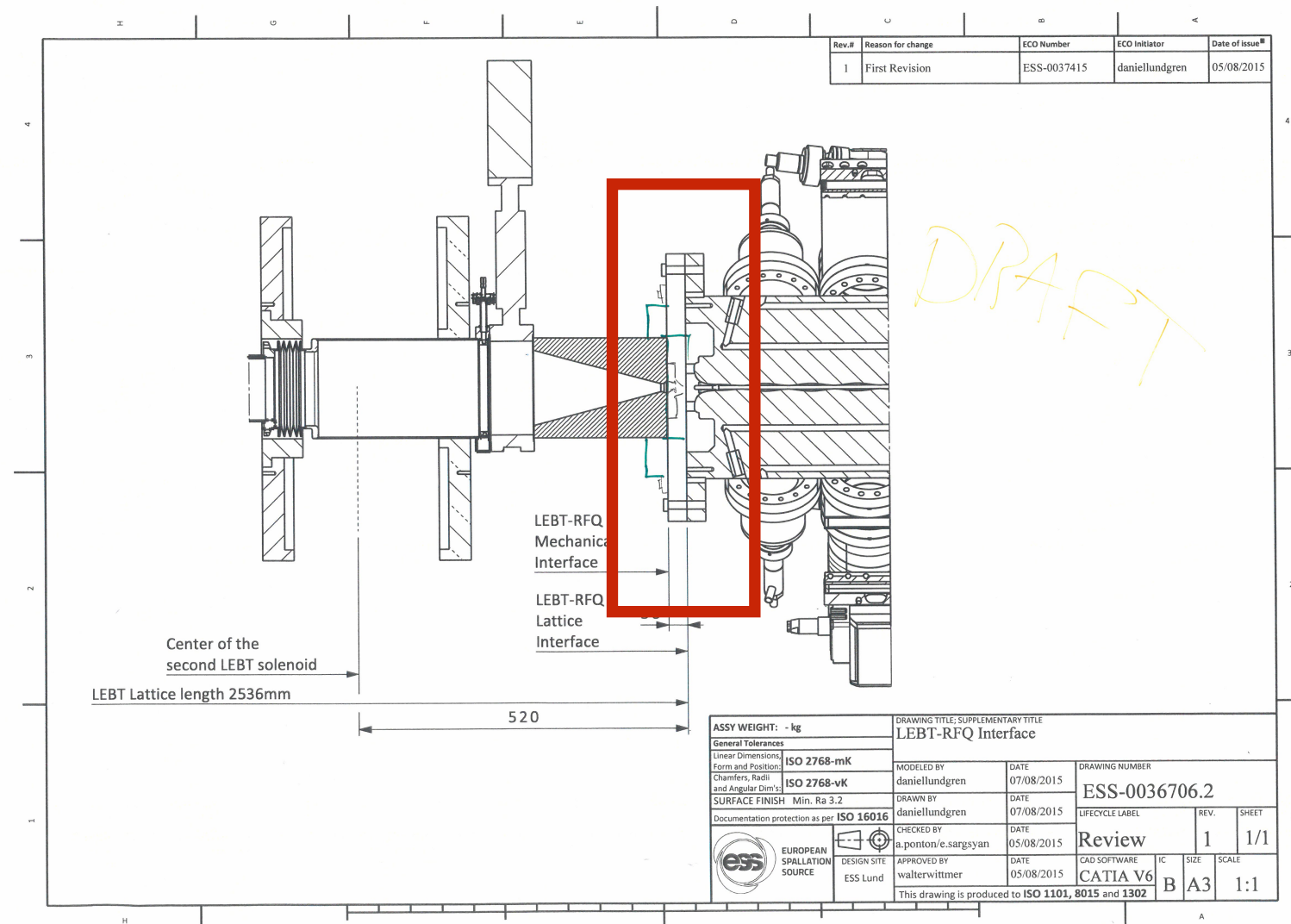
RECENT LATTICE CHANGES

Mamad Eshraqi on behalf of beam physics work package



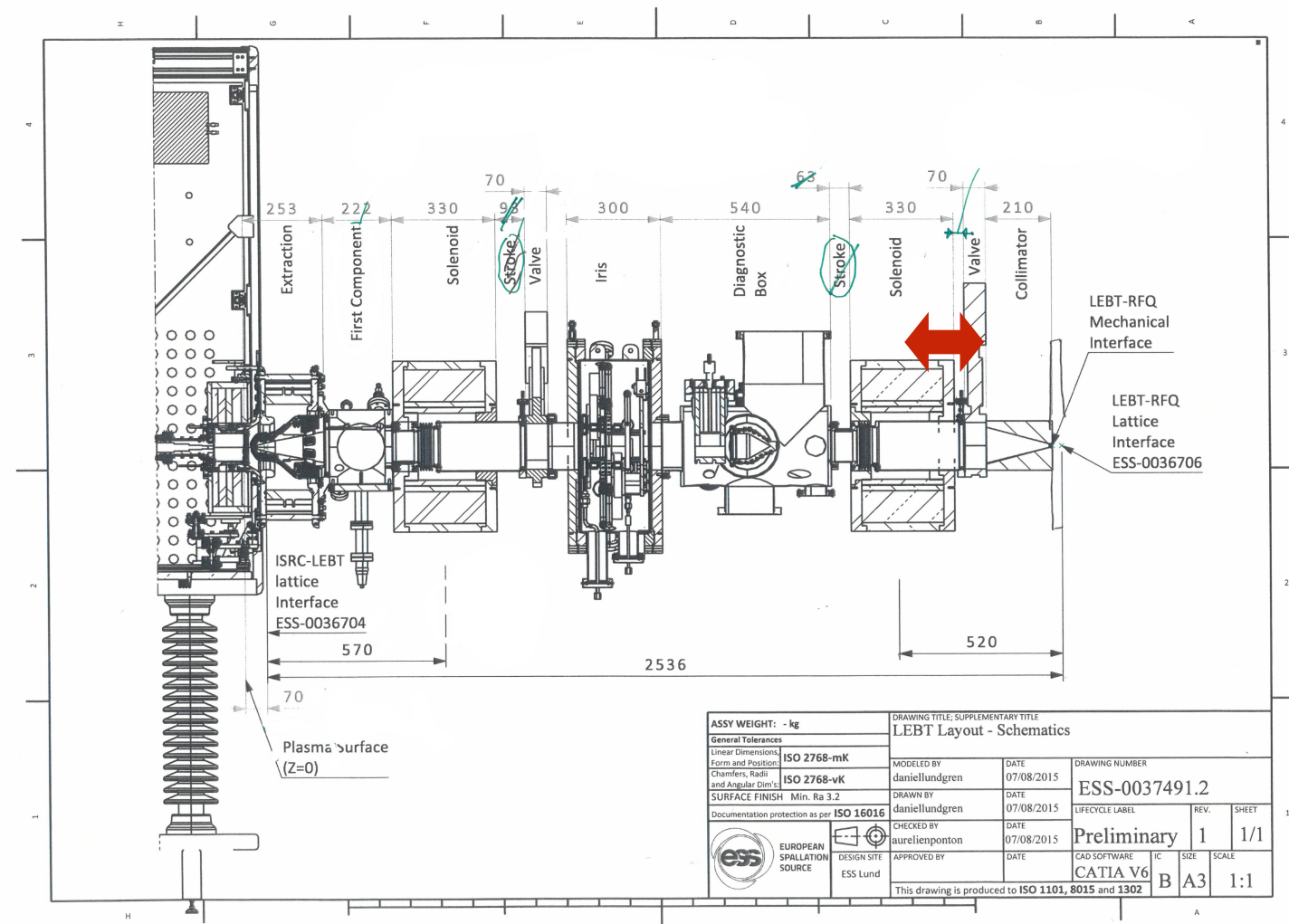
LEBT-RFQ

- The LEBT-RFQ interface is under study, since the two work units have different time priorities, it is proposed to create a mechanical interface where the involved parties could work independently.



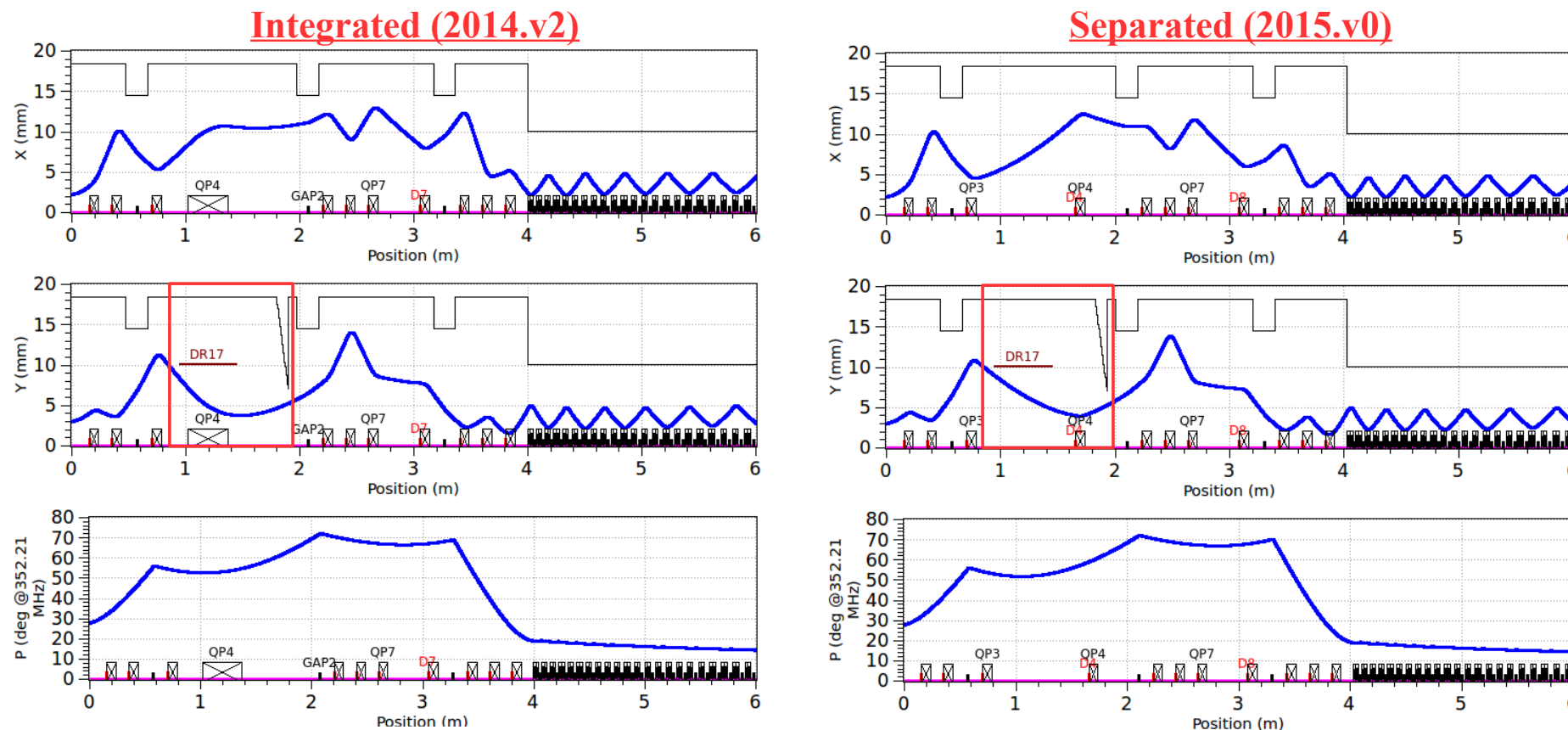
LEBT

- Moving one vacuum valve from downstream of the second solenoid to upstream of that solenoid.



MEBT I

2 layouts: chopper & quad integrated vs separated



- ESS MEBT lattice structure:
(Triplet) + (Chopper+Dump) + (Triplet) + (Diagnostics Box) + (Quadruplet)
- **The *chopper quad* was originally considered to surround the chopper (like LINAC4) but this has been questioned.**
- Two configurations are tried and the difference is minor from the point of view of beam physics, as seen in the following slides.

MEBT 2

Lengths of elements and spaces in 2015.v0c

	2015.v0b	Bilbao's excel v3	2015.v0c
Quad	100 (10+80+10)	100 (6+88+6)	100 (6+4+80+4+6)
Buncher	190	180	180
Chopper	550 (50+450+50)	550 (50+450+50)	550 (50+450+50)
Dump	200 (150+0+50)	200	200 (150+0+50)
Initial drift	150	133 (30+103) ??	150 (72+35+43)
Final drift	100	113 (103+30) ??	100 (43+35+22)
Quad-quad drift	100	100 (102.6 for WS)	100
Quad-buncher drift	30	41	41
Chopper-Q4 drift	30	0	0
Q4-dump drift	120	102.6	150
Diag box drift	350	350	350 (400, 450)

- Practically, the only change from 2015.v0b to 2015.v0c is in the quad-buncher space so the difference should be very small.
- From beam dynamics point of view, the initial drift certainly has some margin (a few cm ??) but the final drift is tighter. More about the interfaces from Aurélien?



Courtesy of Ryoichi Miyamoto

PULSED MAGNETS

- After a recommendation on changing the quadrupoles downstream of the DTL (except A2T and Dipoles) to pulsed magnets, layout of the LWUs in Spoke, MBL, HBL, HEBT, Dogleg have changed

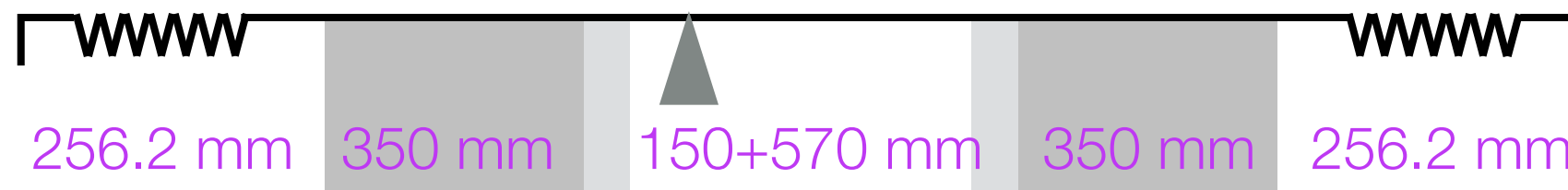
SWU

Spoke Warm Unit



EWU

Elliptical Warm Unit



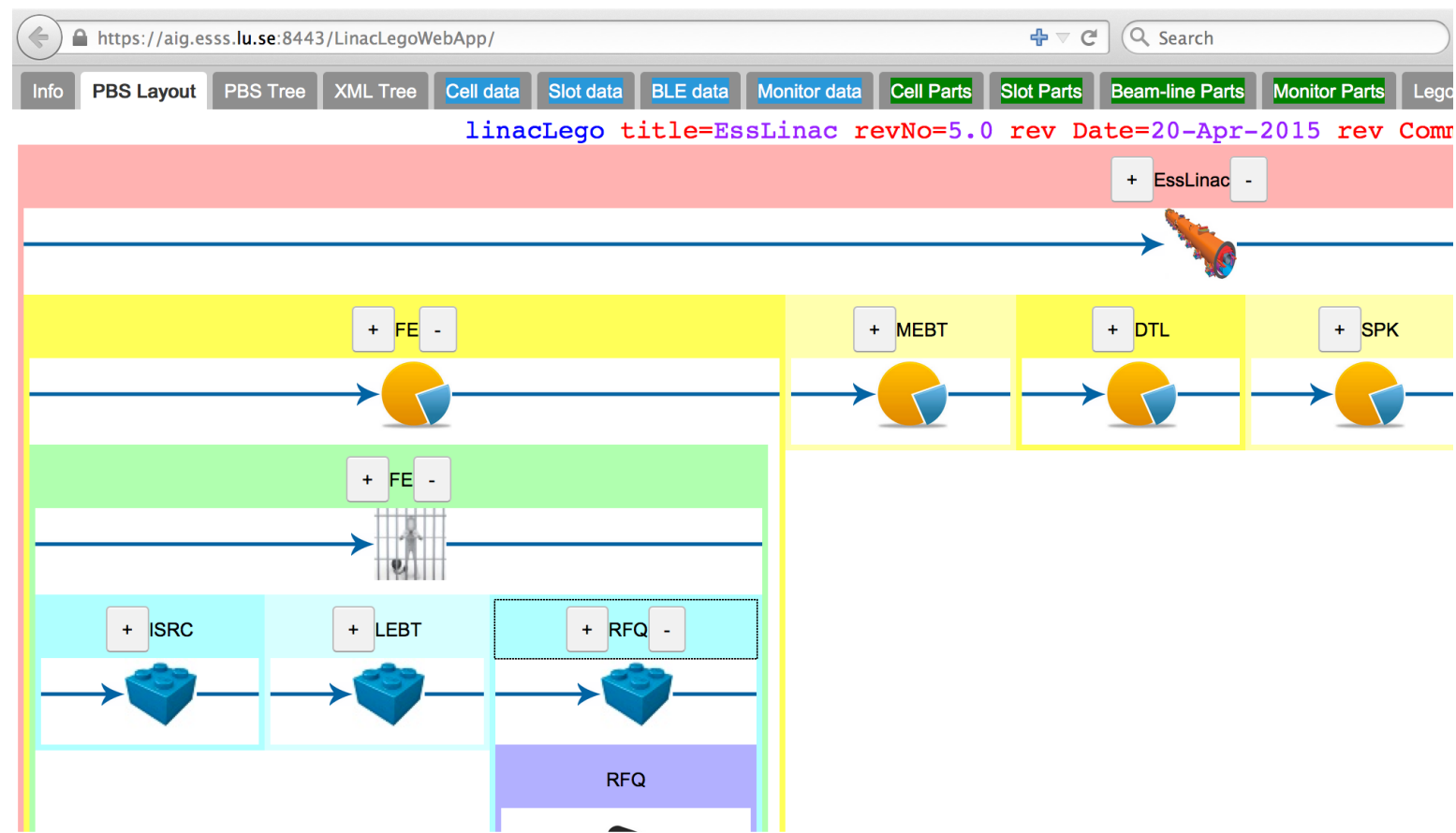


INTERFACE MARKERS

```
;-----  
; ---          LEDP START          ---  
;-----  
DRIFT 400 20 0  
QUAD 250 6.27303 30 0 0 0 0 0 0  
DRIFT 120 50 0  
;DIAG_POSITION N-I 0 0 0.2  
ADJUST 49001 1 0 -0.0013145001 0.0013145001 0  
ADJUST 49001 2 0 -0.0013145001 0.0013145001 0  
THIN_STEERING 0 0 50 0  
DRIFT 460 50 0  
QUAD 250 -5.65192 30 0 0 0 0 0 0  
DRIFT 400 30 0  
;-----  
; ---          LEDP END            ---  
;-----  
;-----  
; ---          CRYO START          ---  
;-----  
DRIFT 371.5 28 0  
FIELD_MAP 100 988 0.671508 28 0 0.950174 0 0 Spoke_W_coupler  
DRIFT 141 28 0  
FIELD_MAP 100 988 17.4919 28 0 0.876163 0 0 Spoke_W_coupler  
DRIFT 371.5 28 0  
;-----  
; ---          CRYO END            ---  
;-----  
;-----  
; ---          SWU START           ---  
;-----  
DRIFT 160 30 0  
QUAD 250 5.80773 30 0 0 0 0 0 0  
DRIFT 120 30 0  
DIAG_POSITION 49001 0 0 0.2  
ADJUST 49002 1 0 -0.0013145001 0.0013145001 0  
ADJUST 49002 2 0 -0.0013145001 0.0013145001 0  
THIN_STEERING 0 0 30 0
```

WHAT IS NEXT

- After insertion of interface markers, beam physics and mechanical, the lattice will be handed over to be uploaded to the LinacLego as the single point of truth.



The screenshot shows the LinacLegoWebApp interface. The browser address bar displays `https://aig.esss.lu.se:8443/LinacLegoWebApp/`. The top navigation bar includes tabs for Info, PBS Layout, PBS Tree, XML Tree, Cell data, Slot data, BLE data, Monitor data, Cell Parts, Slot Parts, Beam-line Parts, Monitor Parts, and Lego. Below the navigation bar, a status bar shows `linacLego title=EssLinac revNo=5.0 rev Date=20-Apr-2015 rev Comr`. The main content area displays a beam line layout with various components and their status (expanded/collapsed):

- EssLinac** (expanded)
- FE** (expanded)
- MEBT** (expanded)
- DTL** (expanded)
- SPK** (expanded)
- ISRC** (expanded)
- LEBT** (expanded)
- RFQ** (expanded)

The bottom of the interface features the ESS logo and a list of recent events:

- Wed Sep 23 09:19:52 GMT+200 2015: Finished building PBS layout view.
- Wed Sep 23 09:19:52 GMT+200 2015: Finished building PBS tree view.
- Wed Sep 23 09:19:50 GMT+200 2015: Finished building BLE data Spreadsheet.
- Wed Sep 23 09:19:50 GMT+200 2015: Finished building XML tree view.
- Wed Sep 23 09:19:49 GMT+200 2015: Finished building Lego Sets Spreadsheet.
- Wed Sep 23 09:19:49 GMT+200 2015: Still building BLE data Spreadsheet.