

Eol - Meeting

Eol. No. 13i: Beam Diagnostic Data Acquisition for FAIR – CR

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Marcus Schwickert, GSI Beam Diagnostics

What is included? / Eol-Definition

Interfaces

Schedule

Resources: Manpower / Funds

Existing Eols

Open questions

What is included?

Data Acquisition (DAQ):

Equipment and Software required to control, digitize, pre-process and transmit detector signals to the accelerator control system.

- The DAQ consists of:**
- Embedded controller / industrial PC
 - Data concentrator / DSP board
 - ADC, scaler/counter, digitizer, I/O board
 - RF equipment (RSA, NWA)
 - DAQ software

- Additionally included:**
- 'Slow Controls' (stepping motor, pressured air drive, hv supply, detector gas supply)

- NOT included:**
- E.g. detectors (mechanics, analog electronics), vacuum parts, drive mechanics, **'long' cables (!)**

Work Breakdown Structure

Updated costbook: Subdivision of a beam diagnostic system <m.n> of CR (2.5.6.*) into sub-components with separate psp-codes:

psp-code	sub-component
2.5.6.m.n.1.	Detector
2.5.6.m.n.2	Vacuum Chamber
2.5.6.m.n.3	Mechanics
2.5.6.m.n.3.1	Stepping-motor Drive
2.5.6.m.n.3.2	Pneumatic Drive
2.5.6.m.n.3.3	Other
2.5.6.m.n.4	Long Cables
2.5.6.m.n.5	Subsystems
2.5.6.m.n.5.1	High-voltage Supply
2.5.6.m.n.5.2	Compressed Air Control
2.5.6.m.n.5.3	Stepping-motor Control
2.5.6.m.n.5.4	Detector Gas
2.5.6.m.n.6	Data Acquisition (per channel)

Subject of International Eols

Example: Beam Position Monitors CR

2.5.6.2.1 BPM Warm Sections

2.5.6.2.1.1	Detector
2.5.6.2.1.2	Vacuum Chamber
2.5.6.2.1.3	Mechanics
2.5.6.2.1.4	Long Cables
2.5.6.2.1.6	Data Acquisition (per channel)

German contribution
Eol no. 13i

Interfaces

Interfaces

(Detector side):

- Signal level
- Time structure
- Bus systems (GigE, IEEE1394...)

Interfaces

(Accelerator control system):

- Software standard:
Front-End Software Architecture, FESA (CERN)
- Data protocols / timing definition
- Fieldbus definition
- Alarms / interlocks specification

Standardized

Components

- Embedded controllers / electronic boards
- Network protocols
- Form factors
- Connectors, cables

Schedule

Due Date	Milestone
03/2009	Creation of DAQ team FESA training
06/2009	Specification & Requirements finished
06/2010	Definition of standard hardware & procurement of pre-series hardware
09/2010	Start FESA implementation
2011	Start hardware procurement
2012	Integration tests of in-kind components
2013	SAT in-kind components
2014	Commissioning w/o, with beam

Resources: Manpower

GSI- Beam Diagnostic Department

M. Schwickert, P. Forck

DSW Detectors&Software 6.8 FTE

LCM Low current Meas. 2.8 FTE

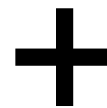
RFT RF Techniques 4.6 FTE

MSR Mainten.&Service 5 FTE

MEC Mechanics&Constr. 2.8 FTE

EXT External Projects 2 FTE

Current total staff: 26 FTE



New EoI-DAQ Team:

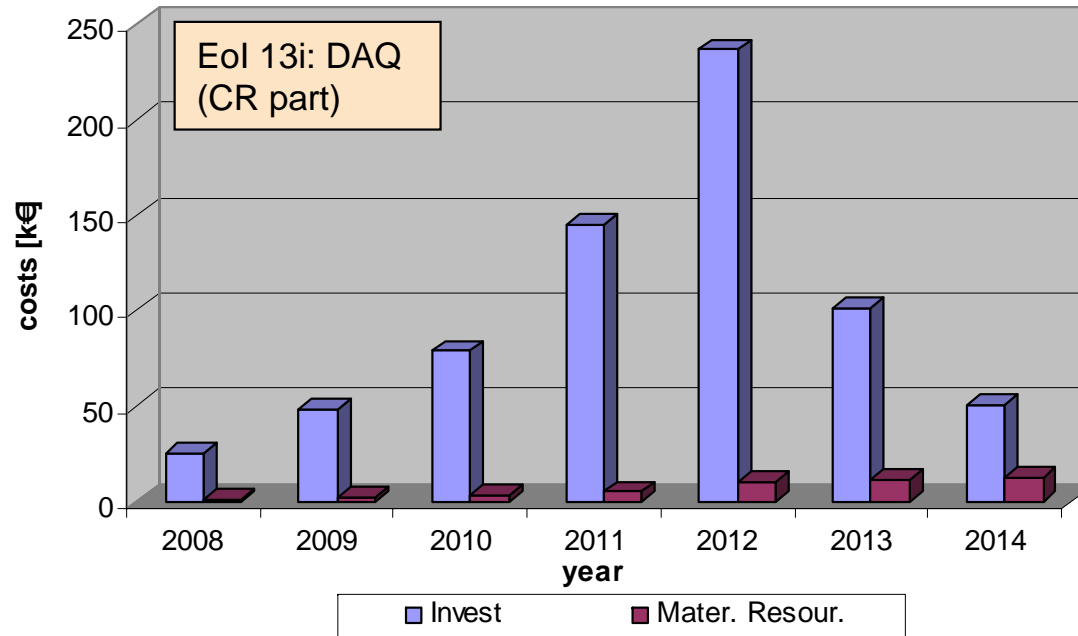
- +1 (2) FTE Physicist
- +2 (5) FTE Engineer (analog/digital/software)
- +1 (4) FTE Technician

Technical support
for EoI-Team

Numbers in brackets refer to final manpower in EoI-DAQ-Team

EoI DAQ	2008	2009	2010	2011	2012	2013	2014	Sum
Required staff [FTE/yr]	1.2	2.1	3.4	4.8	9.0	10	10.5	40.5

Resources: Funds



		2008	2009	2010	2011	2012	2013	2014	Sum	
CR	Mater. resour.	1	2	3	5	10	11	13	46	k€
	Investment	25	48	79	145	237	102	51	687	k€
All	Mater. resour.	21	42	68	96	200	220	250	897	k€
	Investment	500	950	1550	2860	4660	2000	1000	13520	k€

Existing Eols

WBS 2.5.6: Beam Diagnostics for CR

Diagnostic System	pcs.	Costs [k€]	psp-code	Contributor	Country
Data Acquisition	all	687	2.5.6.?.?.6	GSI	Germany
... ?					

Open Questions

- Availability of additional Eols?
- Definition of testing procedures (Factory acceptance tests / Site acceptance tests)
- Definition of standards (electronics, signals, test software....)
- Responsibility for cabling
- Clarification on materials resources / travel costs for Eols
- Formal agreement on provision of manpower at GSI