PS Complex FEC renovation: Status, guidelines, time scale

Claude-Henri Sicard AB/CO

ATC/ABOC Days 2008

PS Complex Front-End renovation

Agenda:

- Inventory of existing front-end hardware and software
- Constraints and guidelines for renovation based on new hardware platforms, geographical and functional aspects
- first estimate on resources (FESA software development, hw procurement and installation)
- possible schedule taking in account equipment group plans.

Scope

- Injector CPS Complex (Lin2, Lin3, PSB, LEIR, CPS, Isolde, Rex, AD)
- Excludes subsystems recently installed under equipment group responsibility (such as on LEIR)
- CTF and new projects (Lin4) not in scope

Present HW inventory

			Camac		1553		GPIB		
	Accel	**FECs**	loop	crates	loop	crates	crates	**Devices**	**Description**
	ADE	24	3	3	12	189	9	2067	Antiproton Decelerator
	CPS	63	5	8	29	393	4	4453	Cern Proton Synchrotron & beam xfer lines
	LEI	32	0	0	5	58		1157	LEIR Low Energy Ion Ring
	LN3	10	0	0	6	106	1	427	Lead Ion Linac
	ISO	6	0	0	2	3	4	650	ISOLDE facility
	LIN	10	2	4	9	156	1	956	Proton Linac
	PSB	56	6	9	12	231	8	3648	Proton Synchrotron Booster
	REX	4	0	0	0	0	0	122	REX facility
Total PS		205	16	24	75	1136	27	13580	

Present HW Inventory: cables & repeaters

Repeaters

16RI	8RI	8RI inTTL	16RI Fast	total installed channels
11	267	11	1	2416

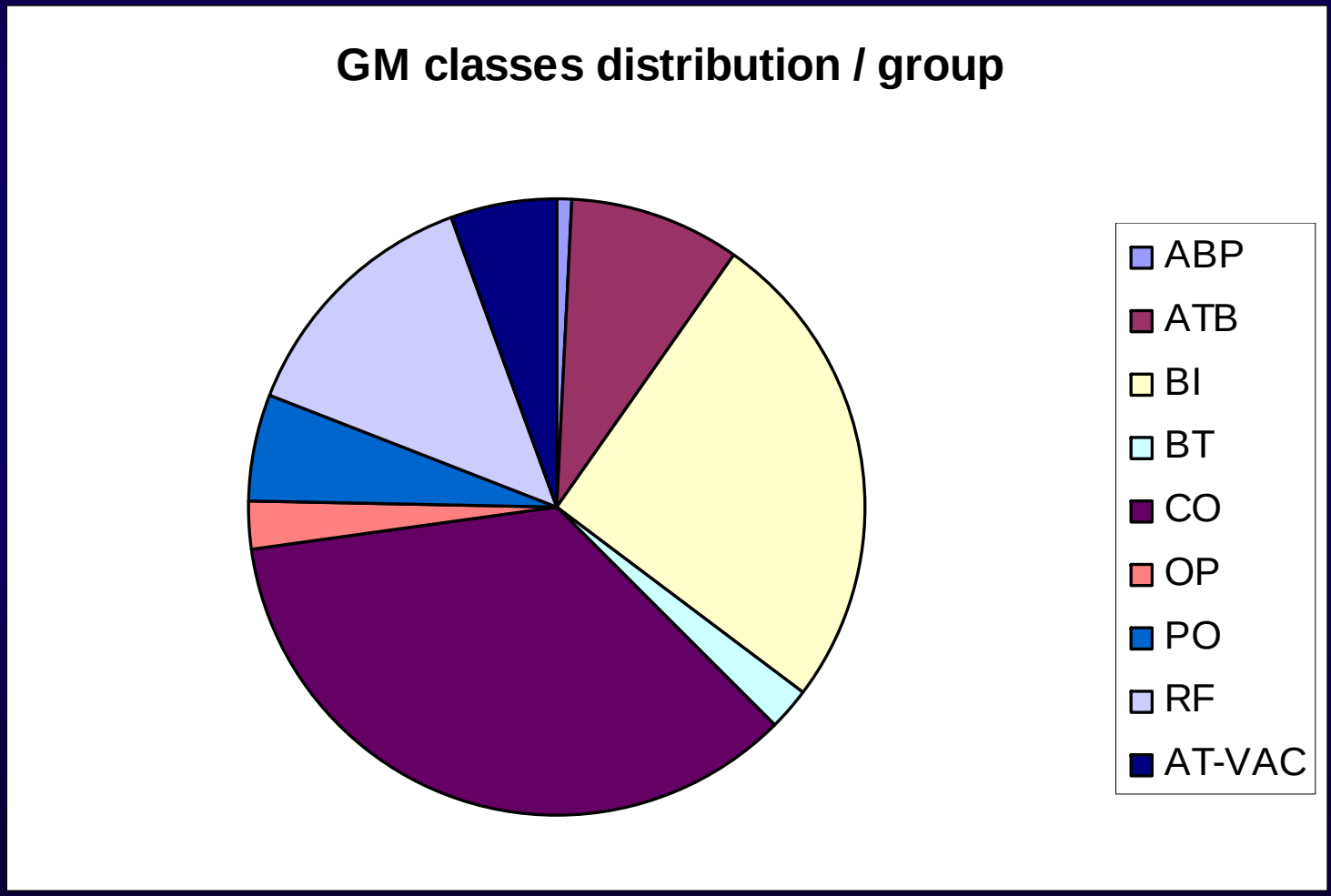
level adapters

LA Blo-ttl	LA ttl-blo	la-filter	lasb	lapf	ptg	10MHz	clk-fanout
125	23	8	22	11	15	27	14

SW Inventory

- Present state: mix of GM and FESA classes
- Eq groups agreed (CO3) taking charge of migrating the GM classes under their responsibility, work already started
- CO will migrate GM classes under its responsibility (45) + others from groups lacking resources (list TBD)

SW Inventory (2)



Guidelines

- Lower-cost solutions whenever possible (crates+cpu, PCI replacing VME, OASIS)
- Parallel deployment of ‘InCA’ at top level (=>avoid need of GM-adapter sw classes)
- Evaluate Middle-tier solution in place of specific FE tasks (Linac Watchdog, Comparator feedback)
- Take in account new platforms, Timing review result and CO-standard modules

Technical guidelines

- Front-ends should belong to one equipment group
- Improve reliability: Reduce cabling, patches and intermediate electronics (repeaters, level converters)
- Deploy FEs according to CO standards (startup, asset mgt,..) to ease exploitation
- HW Priorities: Eradicate Camac (fully for startup 2009) and obsolete modules
- Existing investment (VXI scopes) to maintain: budgetary constraints & no immediate obsolescence

New CO FE platforms & HW

- New Industrial PC / Linux, PICMG
  - Market survey done
  - Available from 2nd semester 08
- VME-based CPU boards contract
- New HW modules devt
  - GFAS
  - Mil1553
  - FPGA-based FIP
- New commercial cards
  - ADCs,…

Project Work packages

1. Review geographical and functional layout of CPS complex
2. Interface new standard CO modules at basic sw level (driver + library)
3. Port GM Classes under CO responsibility (25 to 30 FESA classes)
4. Consolidate crates, CPUs & CO HW
5. Install and cabling front-ends
6. Specific CO Domains: Oasis, Warm Interlocks,..

Resources -1st guess

- Financial needs:
  - 3MCHF for hw platforms
  - 300K for additional sw manpower

Planning aspects

Project covers 2008-2012 period

First steps are:

- Start FESA migration Q2/08, priority targets low-cost replacement of present VME solutions, in relation with Eqp group plans
- Layout study: end summer08

Following plans depends on:

- Work units planned by equipment groups
- Controls hw obsolescence
- Coordination with InCA development

Conclusion

- Coordinated work shared between equipment groups, CO and OP
- CO3 committee is the right place to ensure good coordination between equipment-oriented renovations and controls-oriented ones