



US CMS EMU meeting

Anode Front-End electronics status.

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Anode Front-End electronics status

- AFEB production status
 - CMP16-G ASIC
 - AFEB production
 - AFEB certification
 - AFEB shipment
- AFEB input cable
- AFEB-ALCT cable production
- Delay chip DEL16 test status



AFEB production status

CMP16_G ASIC

1. Pre-production submission

- Produced 1900 chips
- Selected “good” chips 1150 chips
- Yield rate 60%

2. Production submission (September 22)

- Produced quantity 25,000
- Tested 14,500
- Selected for soldering
 - for US 10,200
 - for Dubna 2,500
- **Yield rate** 90%
- Rejection reasons:
 - dead channels
 - chip threshold out of range
 - channel to channel threshold variation inside chip out of range
 - other



AFEB production.

During November - December of 2001
39 boxes with 9,920 anode boards
were delivered to FNAL .





AFEB production display

Total ordered 10,000 = 9,184 + 816 spare.

AFEB for ME4/1 chambers are not included in the table.

Total delivered to FNAL 9,920

	CY2001					CY2002												Made	Total needed	Balance	Ship- ped out.	Total at FNAL
	prev.	Sep.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	Jun.	Jul.	Aug.	Sep.	Oct.	Nov.	Dec.					
Delivered to FNAL	1109			747	2446													9920	10000	80		9672
Burned in	1109			400	1600	600												3709				
Assembled		380		780	1600													2760				
Certified		250		580	1500													2330				
Packaged			248			1039												1287				
Shipped to:																						
UF			124																			124
UCLA			124																			124
PNPI																						0
IHEP/flat																						0
IHEP/tray																						0
																						Total shipped out: 248

Certification statistic: Total measured 2722
 Total certified 2331
 Yield rate after cuts 85.6%
 Final yield rate (including chip selection) ~75%

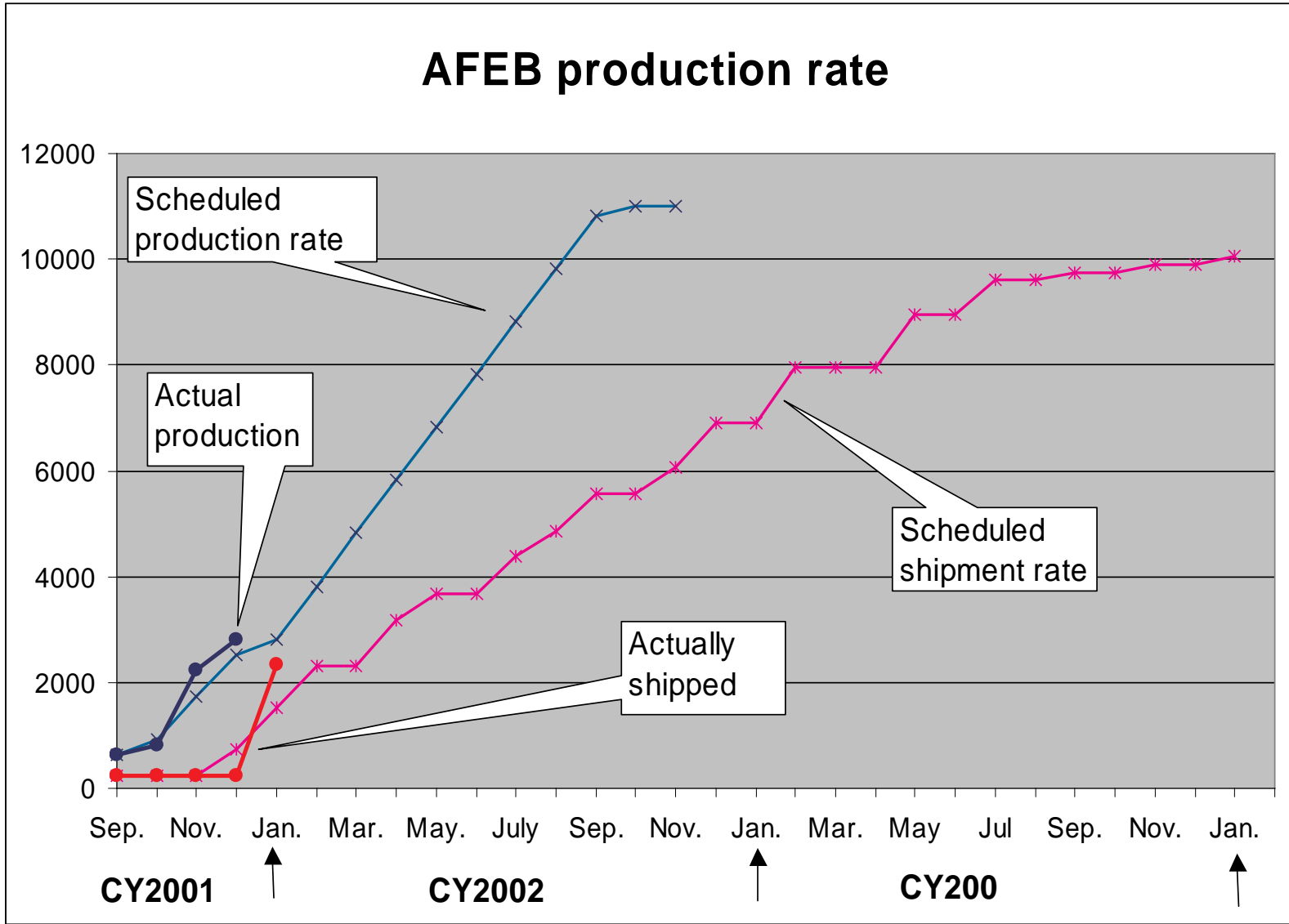


AFEB production and shipment schedule

		CY2001												CY2002												CY2003												CY2004	
		Apr	May	Jun.	July	Aug.	Sep.	Oct	Nov.	Dec.	Jan.	Feb.	Mar.	Apr	May.	Jun.	July	Aug.	Sep.	Oct	Nov.	Dec.	Jan.	Feb.	Mar.	Apr	May	Jun	Jul	Aug.	Sep.	Oct	Nov.	Dec.	Jan.	Total			
Chip production	AMF-ASA T 1900					Total 2500 0																																	
Incoming inspection	CMU LAB7	1900					1000	5000	5000	1000	1000	1000	1000																								16900		
	Actual	1900					1000	6000	6000	1000																										15900			
AD16 board	AFEB soldered	ACC	1100								3630	5181	89																							10000			
	AFEB burn in test	LAB6		500	600				200	500	1000	1000	1000																							4800			
	Actual			500	600				200	600	1000	600																								3500			
	AFEB certification	LAB7				620		300	800	800	300	1000	1000	1000	1000	1000	1000	1000	180																	11000			
	Actual					620		200	1400	600																										2820			
	Shipping rate to:																																			0			
	UCLA						124			240					240			240			240			240				216							1540				
	Actual						124				520																									644			
	UF						124			240					240			240			240			240				216							1540				
	Actual						124				520																									644			
	PNPI										504	504		588			432		432			504		432			432		504						4332				
	Actual										520																									520			
	China/fat										216	216		212			212		212			252													1320				
	Actual										520																									520			
	China/tay										72	72		72			72		72			84		144			144		144		144		144		168	1332			
	Actual																																			0			
	Total						248			480	792	792		872	480		716	480	716		480	840	0	1056			1008		648		144		144		168	10064			
	Actual total						248	0	0	0	2080	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2328			



AFEB production and shipment rate





AFEB input cables status



Input cable specification:

Inp1 - 2.5" - 1332 cables.

Inp2 - 5.0" - 1332 cables.

Inp3 - 7.5" - 1332 cables.

Material:

.050" Pleated Foil Shielded Cable

3M 90404 Series

Flat, Halogen Free

Production : SUB-SEM, Inc.

All cables are made.



Anode electronics assembly procedure.

The following instructions were prepared:

Instruction for AFEB installation (<http://www-hep.phys.cmu.edu/cms/>)

Instruction for AFEB-ALCT cables installation for ME234/2 chamber (<http://www-hep.phys.cmu.edu/cms/>)

Instruction for AFEB-ALCT cables installation for ME1/2 chamber -first release

Instruction for AFEB-ALCT cables installation for ME2/1 chamber -first release

Need to prepare:

Instruction for AFEB-ALCT cables installation for ME1/3 chamber - the chamber just delivered to the Lab 7.

Instruction for AFEB-ALCT cables installation for ME3/1 chamber - the chamber just delivered to the Lab 7.

Instruction for AFEB-ALCT cables installation for ME4/1 chamber -

Found problems: Broken few M4 threads (AFEB fixation bracket mounting screw)

Two options to fix the problem were proposed: M4 insert nut and M5 screw.

Solution to predict this problem in the future:

Supply every FAST site with a standard screwdriver with low power and with an adjustable torque.

The AFEB installation instruction needs some correction to meet new requirements.



AFEB-ALCT cables display

Chamber type	FAST site	CY2001											CY2002						Total needed	Balance	Ship.	Stored at FNAL
		Mar	Apr.	May.	Jun.	Jul.	Aug.	Sep.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May.	Jun.	Made				
ME 234/2	deliv.		7		30			10	10	10		10						77	148	71		16
	UF						15					16									31	
	UCLA					1	15					14									30	
ME1/2	deliv.		8		31			10	10	10		10						79	74	-5		79
	IHEP																				0	
ME1/3	deliv.							1	5	9		9						24	74	50		24
	IHEP																				0	
ME2/1	deliv.				29			8										37	38	1		1
	PNPI											36									36	
ME3/1	deliv.								6	6		6						18	38	20		18
	PNPI																				0	
ME4/1	deliv.																	0	38	38		0
	PNPI																				0	

Total cables to produce - 10760
 Total produced cables - 6354
 Production balance - 4406

ME2/1 - almost completed, 36 sets shipped to PNPI
 ME1/2 - completed, ready for shipping to IHEP
 ME4/1 - at standby position.

Problems: Some number of wrong assembled cables were found in UCLA and in UF.
 The reason - an engineering mistake in the Company's documentation. The mistake was corrected.
 All available cables were fixed.



AFEB-ALCT cables display

Number of chamber cable sets delivered to FNAL

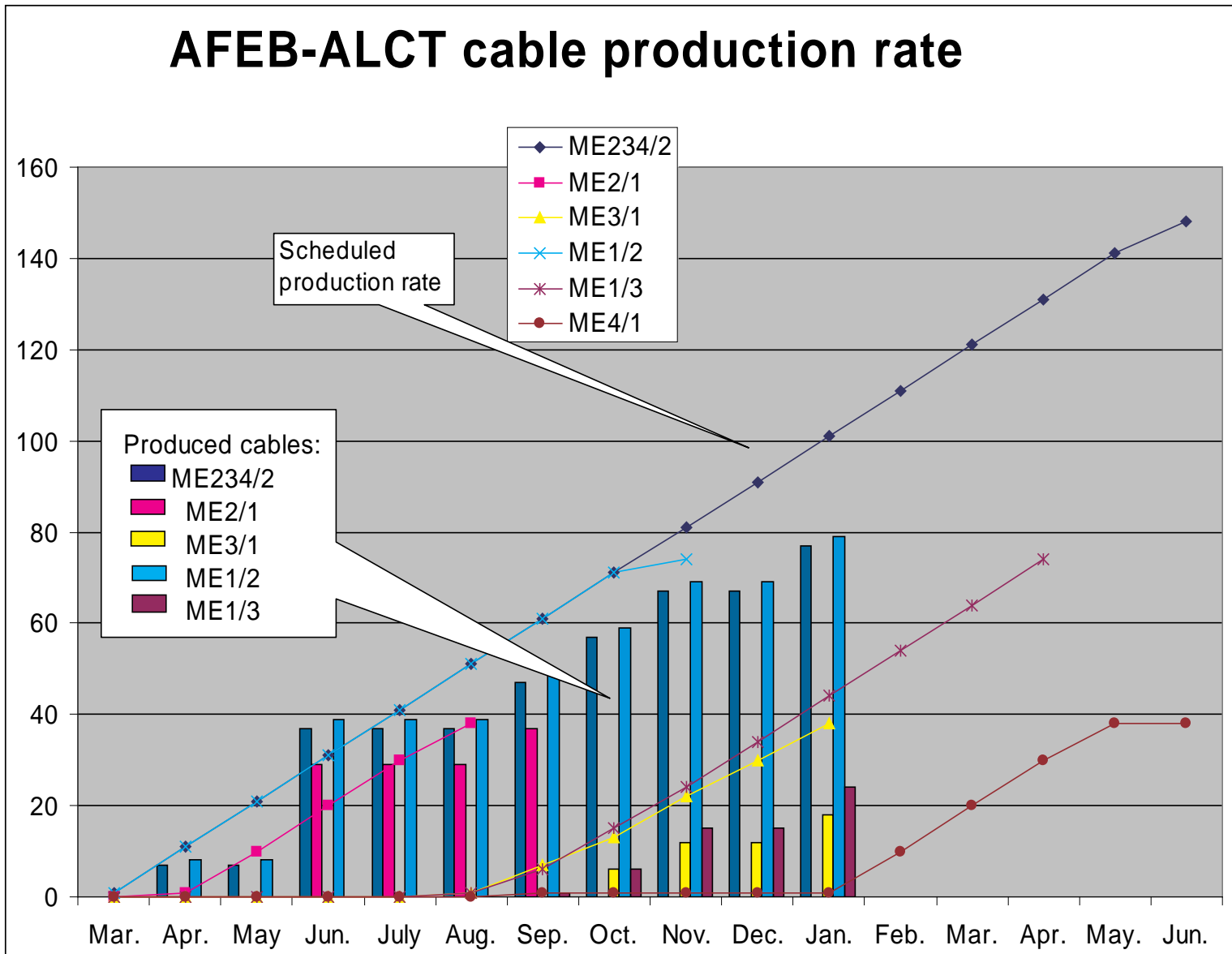
Chamber type		Total scheduled	Production of cable sets for each chamber type, monthly rate.																Total delivered	Cable length (foot)	Balance of delivered sets
			CY2001										CY2002								
			March	Apr.	May	Jun.	Jul.	Aug.	Sept.	Oct.	Nov.	Dec.	Jan.	Feb.	March.	Apr.	May	Jun.			
ME234/2	Scheduled	148	1	10	10	10	10	10	10	10	10	10	10	10	10	10	7				
	Delivered			7	30			10	10	10			10					77	12127.5	71	
ME2/1	Scheduled	38		1	9	10	10	8													
	Delivered				29			8										37	6021.75	1	
ME3/1	Scheduled	38						1	6	6	9	8	8								
	Delivered									6	6	6	6					18	2457	20	
ME4/1	Scheduled	38	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/		
	Delivered	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	0	38
ME1/2	Scheduled	74	1	10	10	10	10	10	10	10	3										
	Delivered			8	31			10	10	10	10		10					79	6428.625	-5	
ME1/3	Scheduled	74						1	5	9	9	10	10	10	10						
	Delivered								1	5	9		9					24	1008	50	
																		28042.88			

Number of cables delivered to FNAL

	Total needs	CY2001										CY2002						Total delivered	Total length of cable	Balance of delivered cables
		March	Apr.	May	Jun	July	Aug.	Sept	Oct.	Nov.	Dec.	Jan.	Feb.	March.	Apr.	May	Jun.			
MC-400073	228		30		93	0	0	30	30	30	0	30		0	0	0	0	243	637.875	-15
MC-400074	906		60		186	0	0	66	90	114	0	114		0	0	0	0	630	1653.75	276
MC-400075	2191		60		531	0	0	156	132	132	0	132		0	0	0	0	1143	4000.5	1048
MC-400076	2642		90		624	0	0	189	177	189	0	189		0	0	0	0	1458	5103	1184
MC-400077	1150		60		447	0	0	132	96	96	0	96		0	0	0	0	927	4055.625	223
MC-400078	453		30		90	0	0	30	30	30	0	30		0	0	0	0	240	1260	213
MC-400079	680		30		90	0	0	33	45	57	0	57		0	0	0	0	312	1638	368
MC-400080	453		30		90	0	0	30	30	30	0	30		0	0	0	0	240	1890	213
MC-400081	453		30		90	0	0	30	30	30	0	30		0	0	0	0	240	1890	213
MC-400082	453		30		90	0	0	30	30	30	0	30		0	0	0	0	240	2310	213
MC-400083	453		30		90	0	0	30	30	30	0	30		0	0	0	0	240	2310	213
MC-400098	698				261	0	0	72	36	36	0	36		0	0	0	0	441	1929.375	257
First shipment, individual cables														Total number of cables				6354		
														Total length of assembled cables				28678.13		



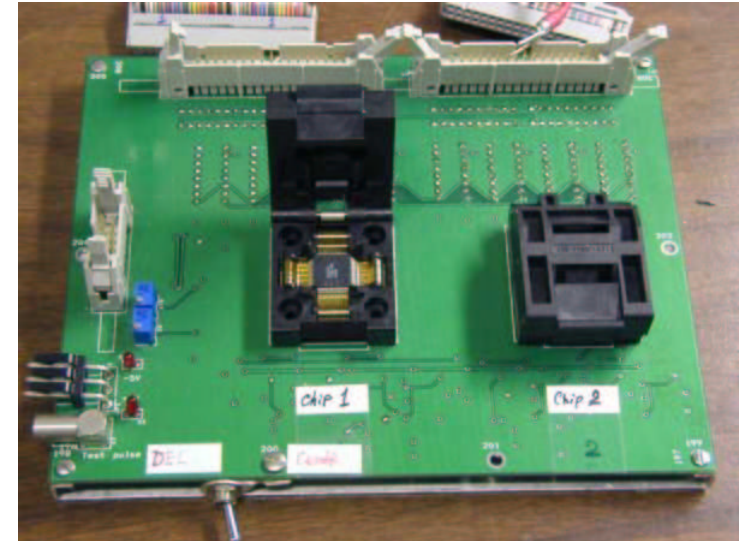
AFEBA-ALCT cables display





Delay chip DEL16 status.

Produced	25,000
Tested	2,639
Rejected (dead)	32
Parameters out of nominal	389
Good chips	2,250
Yield rate	~ 85%
All good chips divided for 9 groups	
Groups 1,2,3,9 are rejected	366
Sent to UCLA for assembly	1120 (Groups 6, 7, 8)
Final yield rate after selection	~70%
Expected number of good chips	~17000 (more strict selection is possible)



The new stand setup and new “on line” program for delay chips selection almost ready.

Problem:

To meet ALCT production requirements, we would like to know ALCT production schedule.