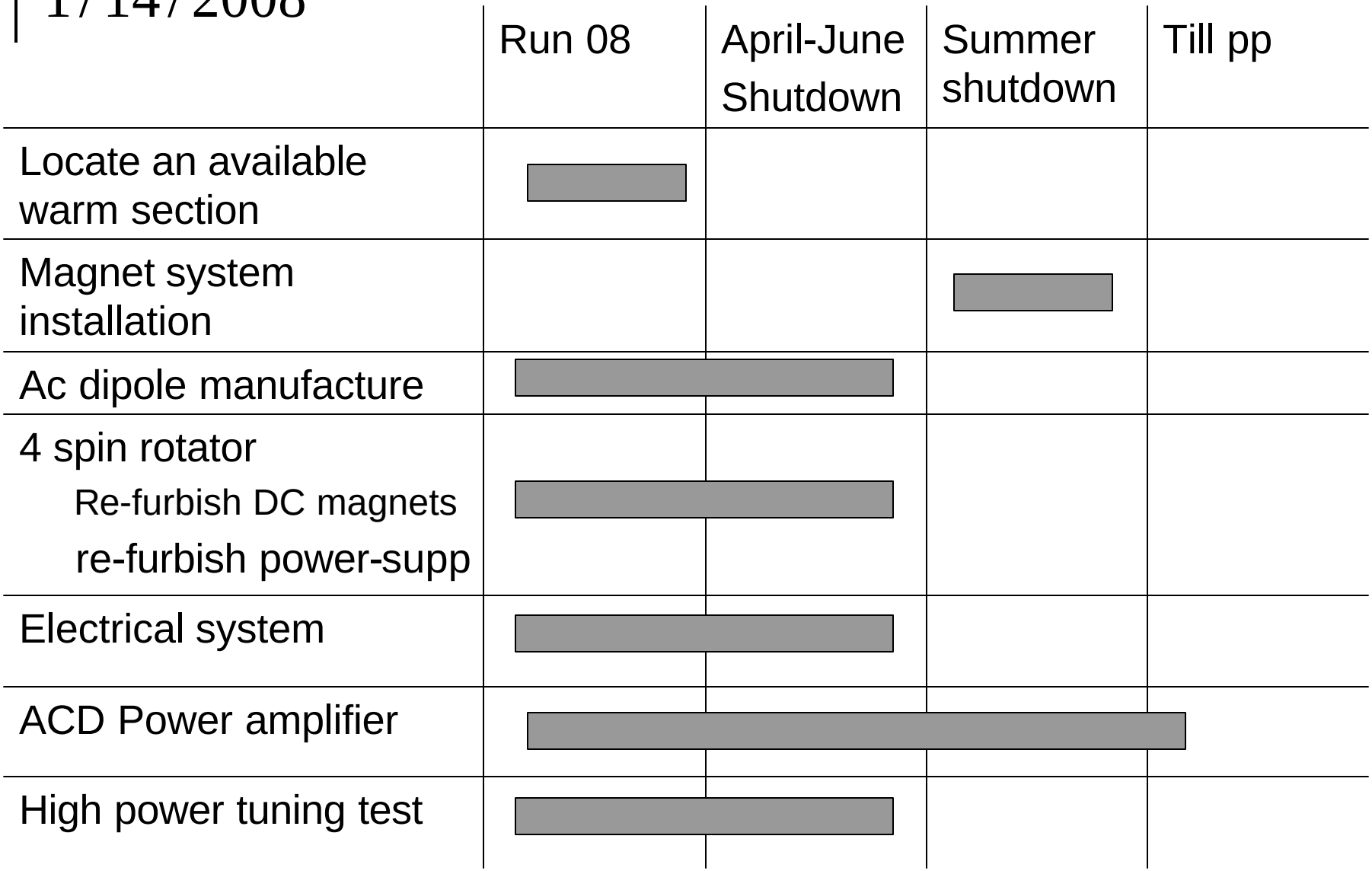
1/14/2008

- Agenda
  - All on the location of the system
  - Pearson+Meng on DC spin rotators
  - Pai: beam pipe and litz wire purchase
  - Oddo on high power tuning circuit test
    - hardware
- Topics
  - Time line
    - Goal: installation in the 2009 summer shutdown

1/14/2008


Run 08
April-June Shutdown
Summer shutdown
Till pp
Locate an available warm section
Magnet system installation
Ac dipole manufacture
4 spin rotator
Re-furbish DC magnets
re-furbish power-supp
Electrical system
ACD Power amplifier
High power tuning test

1/14/2008

- Location of the system
  - Candidates:
    - IP2: sector 2 side has IPM and other instruments on the way. Needs to re-locate at least IPM. However, Tom Russo did point out that there is a plan to re-locate both IPMs to IR6 and IR10. Another concern about IP2 is this is the location for future coherent electron cooling
    - IP12: sector 11 side, close to Q4 is already reserved for Stochastic cooling(yellow pickup).
    - IP10: incoming beam part is open. So we have to Install the two flipper systems on either side of the IP(blue flipper in sector 9 and yellow flipper in sector 10)
    - IP6: sector 5 side has larp wire compensator+2 roman pots. sector 6 side has the scraper+ 2 roman pots
  - Discussion
    - Charlie showed the layout of 18D32 in a standard RHIC warm section. It fills up the tunnel and seems the only place possible is IP2.

1/14/2008

- Location of the system
  - Discussion
    - Charlie also mentioned that the original 18D36 mark3 does not even exist. So, he, Phil and Yousef found another type of dc dipoles. The nice thing about this new type is it is much smaller and fits nicely. The price we pay is the length. These are 6 foot long magnets.
    - however, they only found 5 of these available. Yousef is tracking for the other 5. The alternative plan is to put 18D72 in the middle which so far only IP2 has the room to accommodate the size of 18D72
    - Charlie also mentioned that to achieve 90 degree spin rotation, the power we need for both systems is 1Mwatt and 500 Gallon of water for cooling. Currently, only IP2 has this kind of capacity. Even though we can upgrade the power system in the other locations, the cost could be an issue
  - Conclusion
    - We will re-measure IP6 and IP10 during the Wednesday maintenance and make a decision from there.

1/14/2008 Cost Estimate

	specs	quantity	Cost est.	Note
Ceramic beam pipe	Copper coated and NEG coated	6	6x$8170+ $2660 engineeing	Needs coating to suppress EC
Ferrites				
Litz wire	2AWG5x5x3x5 6x38, polyimide coating, ETFE jacket	600 feet	$15,000	For 4 ac dipoles
capacitors				Needs to know the loss from the magnet to decide
Others for EE system				
Re-furbish DC rotator				allow baking
Re-furbish DC rotator pw				

Ceramic Chamber Cost and Inner Coating: C. Pai

Cost:

Vendor A: Will build per our drawing

Two assemblies @ $11,020 each.
Six assemblies @ $ 8,170 each.
Engineering charge: $ 2,660 Lot.

Vendor B: Will Build with different transition

Two assemblies @ price not ready yet
Six assemblies @ price not ready yet
Engineering charge: @ price not ready yet
Length is no problem.

Coating: (Electron cloud issue)

Vacuum group has the setup to do the following coatings

but need some R &D works to set coating parameters

1. Copper coating
2. TiN coating
3. NEG (Non Evaporable Getter)

LITZ wire cost and length needed: C. Pai

Type:

2 AWG 5X5X3/56/38 Polyimide film coating with ETFE Jacket

(Same as current AC-dipole).

Cost: (Depends on length and minimum order)

$11898/ 500ft (@$23759/1000 ft, minimum 500 ft)
$21647/1000 ft (@$21647/1000 ft, minimum 1000 ft)
Lead time: 50 business days

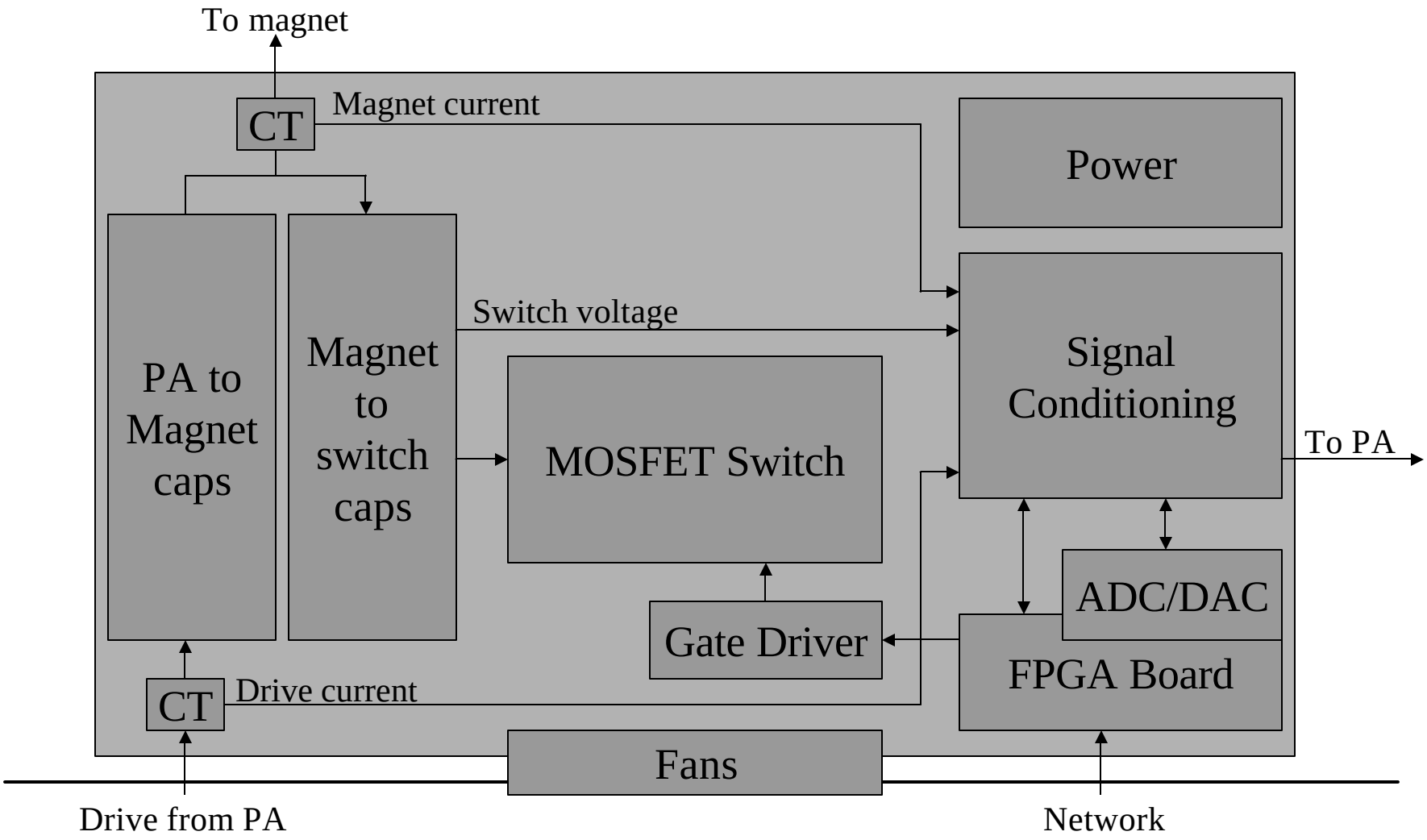
Length Needed

Coil: 80 ft /magnet (8 turns/mag, 1.2 m long)
Power supply S: 40 ft/maget (20 ftx2)
Total: 600 Ft (with 25% extra)
Cost: $14,278 /600 ft (minimum 500 ft)

High power tuning circuit test: Peter Oddo

- Need to demonstrate the dynamic tuning technique at 1kw level. For this, Peter agreed to provide a detailed work plan for the test setup at his early convenience, hopefully, by the end of January. With this plan, we can then start to work on set up the system for the high power testing while Peter continues to work on the FPGA code&software driver.

Tuning Box Block Diagram: P. Oddo



1kW Tuning Box Hardware Plan: P. Oddo

- Characterize prototype magnet — 2 days
- Finalize design — 2 weeks
  - Switch voltage monitoring
    - Extra ADC or PSoC
  - Physical layout
    - Driver/cooling/signal conditioning/power
- Build box — 1 week

FPGA VHDL Code Plan: P. Oddo

- Switch voltage monitoring — 1 week
- Integrate modules — 2 weeks
  - ADC processing
  - Feedback support
- Workable system — 1 week
  - Building BSP with Xilinx EDK

Plan

- We all agree to order 6 ceramic pipes
- Joe suggest we look for an ac dipole vendor as we did last time. The advantage of this is we don't need to order Litz wire on our own. However, as Pai pointed out, there is a 50day lead time for the Litz wire order, we should send the ac dipole order to the vendor as soon as possible. Since the ac dipole design is almost finished, we should schedule a magnet review before we send out the order. Joe and Meng are working on this.
- Mei will check with Dejan whether 4inch ID is okay for the DC spin rotators. Charlie prefers this so that he can avoid the 7in gap for baking
- Measure IP6 and IP10 to see the new type of dipole can fit in the area
- Peter continuers to work on the high power tuning circuit test. He thinks he can have the setup ready at the end of March. John agrees that we should schedule a review on this subject by then.