Title	***Fast Steering Corrector Relocation***			
Project Requestor	Mark Jaski			
Date	March 28, 2008			
Group Leader(s)	Liz Moog			
Machine or Sector Manager	Louis Emery			
Category	Beam Stability			
Content ID*	APS_XXXXXX	Rev.	ICMS_Revision	ICMS Document Date

*This row is filled in automatically on check in to ICMS. See Note [1]

Description:

Start Year (FY)	**FY08**	**Duration (Yr)**	**3**

Objectives:

To relocate the BH4 storage ring corrector magnets to between sections 3 and 4 in order to increase their frequency response.

Benefit:

This will make more corrector magnets available to Real-Time Feedback System (RTFB). After implementation there will be a total of two correctors per sector, doubling the number of spatial modes of orbit distortion that can be corrected. It is expected that the magnitude of the orbit noise spectrum in the range 0-60Hz will be decreased by nearly a factor of two in the sectors affected, producing a more stable beam.

Risks of Project: See Note [2]

For 17 sectors the corrector magnets directly get moved to the open space available between sections 3 and 4 with very low risk.

For 9 sectors the corrector magnets will displace a skew quadrupole to a different location within the sector which is of no consequences with present and future optics.

For 6 sectors (in the last phase of the project) the correctors will displace some diagnostics (flourescent screens) that are sometimes used in commissioning new lattices.

The last phase of the project, regarding the remaining corrector magnets, will be reassessed in the future.

The B:H4 and B:V4 correctors are more or less redundant at their present locations. There are corrector magnets nearby (A:H4 and A:V4) that will take up their role for DC orbit correction. If somehow the correctors B:H4 and B:V4 do not provide the benefits expected to RTFB, we have not lost anything. They will still operate correctly in DC orbit correction, their original function.

Consequences of Not Doing Project: See Note [3]

The overall RTFB will be limited in its performance to present conditions. Also the separate project which is planned to increase the sampling rate of the real-time feedback system will not see full benefits without the addition of a second corrector.

Cost/Benefit Analysis: See Note [4]

The alternative to increasing the number of spatial modes for orbit correction is to construct new correctors at the location of the B3 bellows. Moving a redundant DC corrector to the new position saves the cost of new correctors. Improvement roughly occurs locally, at a cost of approximately $7k per sector.

Description:

Phase 1: Move 17 BH4/BV4 corrector magnets from their current location to between sections 3 and 4.

Phase 2: Move 9 skew quadrupole magnets from between sections 3 and 4 to between sections 1 and 2 and then move 9 BH4/BV4 corrector magnets from their current location to between sections 3 and 4 where the skew quadrupole magnets were.

Phase 3: Remove 6 flags from between sections 3 and 4 and move 6 BH4/BV4 corrector magnets from their current location to between sections 3 and 4 where the flags used to be.

Phase 4: This will involve managing the scraper and strip line locations between sections 3 and 4 and will be reassessed in the future.

Funding Details

Cost: ($K)

Use FY08 dollars.

Year	AIP	Contingency
1	140	4
2	0	0
3	36	1
4		
5		
6		
7		
8		
9		
Total	176	5

Contingency may be in dollars or percent. Enter figure for total project contingency.

Effort: (FTE)
The effort portion need not be filled out in detail by March 28

Year	Mechanical Engineer	Electrical Engineer	Physicist	Software Engineer	Tech	Designer	Post Doc	Total
1	0.4				0.57			0.97
2	0.33				0.7			1.03
3	0.31				0.85			1.16
4								0
5								0
6								0
7								0
8								0
9								0

Notes:

[1] **ICMS**. Check in first revision to ICMS as a *New Check In*. Subsequent revisions should be checked in as revisions to that document i.e. C*heck Out* the previous version and C*heck In* the new version. Be sure to complete the *Document Date* field on the check in screen.

[2] **Risk Assessment.** Advise of the potential impact to the facility or operations that may result as a consequence of performing the proposed activity. Example: If the proposed project is undertaken then other systems impacted by the work
include ... (If no assessment is appropriate then enter NA.)

[3] **Consequence Assessment.** Advise of the potential consequences to the facility or to operations if the proposal is not executed. Example: If the proposed project is not undertaken then ____ may happen to the facility. (If no assessment is appropriate then enter NA.)

[4] **Cost Benefit Analysis.** Describe cost efficiencies or value of the risk mitigated by the expenditure. Example: Failure to complete this maintenance project will result in increased total costs to the APS for emergency repairs and this investment of ___ will also result in improved reliability of ____. (If no assessment is appropriate then enter NA.)