Title	***Monopulse rf Beam Position Monitor Upgrade***			
Project Requestor	Glenn Decker			
Date	March 25, 2008			
Group Leader(s)	Glenn Decker			
Machine or Sector Manager	Louis Emery			
Category	Beam Stability			
Content ID*	APS 1255203	Rev.	2	3/28/08 12:00 AM

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

Description:

Start Year (FY)	**FY07**	**Duration (Yr)**	**5**

Objectives:

Deploy new FPGA-based monopulse rf bpm data acquisition system.

Benefit:

Improved AC beam stability; improved capability for the diagnosis of noise sources and unintentional beam losses.

Risks of Project: See Note [2]

During the commissioning phase, existing x-ray and narrowband rf bpms will we used to assure acceptable beam stability. AC beam stability could conceivably be degraded during this period.

Consequences of Not Doing Project: See Note [3]

The existing monopulse beam position monitor electronics date to 1993. Spares are depleted to a level were maintenance is becoming difficult. The inherent noise level in the existing electronics is too high for use in the next-generation real-time feedback system. Post-mortem analysis of beam loss events is becoming more difficult as the old beam history modules continue to deteriorate.

Cost/Benefit Analysis: See Note [4]

Expected investment is $500k over a two to three year period. This is one element necessary to achieving 200 nanoradian rms pointing stability, which will serve the APS through the next decade and beyond. Being field-programmable, this technology will allow enhanced diagnostic capability such as real-time spectral analysis.

Description:

Building on the experience gained with the first production units installed in sector 38, a detailed knowledge of the parts necessary to complete this project is in hand. Each new double sector will require two receiver chassis, 4 BSP-100 data acquisition / processing modules, along with MFI-100 and FCF-100 electronics boards to interface the system with the feedback system. Experience shows that the hardware costs amount to $30k / double sector. Parts are in hand for three double sectors, so an additional $510k plus funds for spares will be required to complete the project.

Funding Details

Cost: ($K)
Use FY08 dollars.

1	45	40
2	185	10
3	185	10
4	140	5
5		
6		
7		
8		
9		
Total	555	25

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		0.5	0.1		0.5			1.1
2		0.25	0.1		0.5			0.85
3		0.25	0.1		0.5			0.85
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.)