Title	***X-ray Beam Position and Flux Monitoring***			
Project Requestor	Glenn Decker			
Date	May 15, 2008			
Group Leader(s)	Glenn Decker			
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)**	**5**

Objectives:

- X-ray bpm system enhancement (APS_1255209)
- Storage ring portable detector upgrade (APS_1255145)
- Microminiature xbpm and flux monitor for high-flux micro-focused hard x-ray beams. (APS_1256819).

Benefit:

Enhance long term pointing stability for insertion device beams to the level of 0.5 microradians p-p for a one week time period; provide quantitative diagnostic of beamline performance with portable detector; provide new diagnostic for microfocused beams, with application to beam position monitoring.

Risks of Project: See Note [2]

The x-ray bpm enhancement will involve standard vacuum intervention / bake procedures for beamline front ends and within beamline first optic enclosures.

Consequences of Not Doing Project: See Note [3]

Users will not benefit from the best pointing stability. Certain classes of experiments requiring outstanding beam stability may not be possible. Source-to-sample optimization capability with the portable detector will be degraded.

Cost/Benefit Analysis: See Note [4]

The x-ray bpm system enhancement forms the largest portion of this proposal, amounting to $35k per beamline , with significant contingency ($7k / beamline). It should provide at least a factor of two improvement in long term pointing stability. Upgrade to the portable detector will be $55k / year over three years and will provide absolute flux and AC centroid and size measurement capability. The microminiature xbpm project amounts to $140k over five years and will develop photoconductive diamond detector capability in house.

Description:

The x-ray bpm system enhancement will provide non-destructive hard x-ray front-end position monitoring and retractable destructive flux monitoring in the first optic enclosure, building on results of studies at 19-ID. The portable detector upgrade will add an absolute flux detector, PIN diode-base AC beam position monitoring, and a fast imaging camera to the existing device, now under test at 35-ID.

Funding Details

Cost: ($K)
Use FY08 dollars.

Year	AIP	Contingency
1	345	65.5
2	335	61.5
3	335	60.5
4	270	52
5	270	52
6		
7		
8		
9		
Total	1555	291.5

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	0.45	0.3	0.26	0.4	0.4	0.3		2.11
2	0.1	0.2	0.21	0.25	0.4			1.16
3	0.1	0.2	0.21	0.2	0.4			1.11
4		0.2	0.05	0.05	0.2			0.5
5		0.2	0.05	0.05	0.2			0.5
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.)