Title	***Improved Matching Ability for the BTS Transport Line***			
Project Requestor	Michael Borland			
Date	March 21, 2008			
Group Leader(s)	Borland, Decker			
Machine or Sector Manager	Louis Emery			
Category	Accelerator Hardware and ID Upgrades			
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)	**2009**	**Duration (Yr)**	**3**

Objectives:

To protect insertion devices and other accelerator components from suffering radiation damage due to electron beam losses, by improving the optics control in the BTS transport line.

Benefit:

Improved operation through better injection efficiency. Reduction in radiation damage to IDs and accelerator components.

Risks of Project: See Note [2]

Low.

Consequences of Not Doing Project: See Note [3]

Damage to IDs and accelerator components.

Cost/Benefit Analysis: See Note [4]

This is an R&D project for the first year with implementation in the subsequent years.

Description:

This is part of a multi-proposal initiative aimed at reducing radiation damage. (See Section 1 of OAG-TN-2008-008 for a full description and explanation of the linkage among the parts).

Beam matching in the BTS will be helpful in reducing beam losses, by avoiding unnecessary betatron mismatch, particularly in the vertical plane. This can best be accomplished with a three-screen emittance measurement and matching system, which will require some layout modifications (including additional quadrupoles) in the BTS. Such a system would allow measurement of the sigma matrix irrespective of quadrupole calibration, which is in doubt for the BTS, and would then allow correction of the sigma matrix to ensure a proper betatron match. Measurements could easily be taken between top-up injections, should that be needed.

Part of this proposal would involve R&D to perform beam physics design and modeling.

Following this, we would modify the BTS line to incorporate five new quadrupoles. We would need to add diagnostics components, including OTR targets, ccd cameras, optical transport, opto-mechanical manipulators, illumination control with read back, plc controls, shrouding, and shielding.

Funding Details

Cost: ($K)

Use FY08 dollars.

Strategic Project Proposal

Funding Details

FY 08 $

Cost ($k)

Year	AIP	Contingency
1	101	10.00%
2	101	
3	101	
4		
5		
6		
7		
8		
9		
Total	303	

Contingency may be in dollars or Percent

The effort portion need not be filled out in detail by March 28

Effort (FTE)

Year	Mechanical Engineer	Electrical Engineer	Physicist	Software Engineer	Tech	Designer	Post Doc	Total
1			0.2					0.2
2	0.5	0.5	0.2	0.2	0.5			1.9
3	0.5	0.5	0.2	0.2	0.5			1.9
4								0
5								0
6								0
7								0
8								0
9								0