Title	***UVC Power Supply Replacement Prototype***			
Project Requestor	Dave Bromberek			
Date	4/16/08			
Group Leader(s)	Ali Nassiri			
Machine or Sector Manager	Louis Emery			
Category	Accelerator R&D			
Content ID*	APS_1256751	Rev.	2	4/16/08 3:55 PM

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

Description:

Start Year (FY)	**2009**	**Duration (Yr)**	**2**

Objectives:

Install a fast switching supply with buck regulation utilizing solid state IGBT high power devices, that also incorporates a fast opening switch/mod-anode tank to eliminate the need for the current crowbar and mod-anode systems.

Benefit:

Performance of current APS booster and storage ring rf high voltage power supplies is not adequate to meet more stringent specification of noise and jitter imposed by the beam. Any noise and jitter generated by the rf power system and propagated through rf distribution will have an undesired effect on beam. These effects will show up as undesired sidebands of the main rf frequency with enough power to affect beam stability. Therefore, it is necessary to deliver a "clean" DC power to klystrons through noise and jitter reduction and more effective regulation of the DC power. We propose to utilize a fast switching supply with buck regulation utilizing solid state IGBT high power devices. This system will meet the noise, jitter, and regulation specification of APS 352 MHz rf systems. In addition, it will eliminate significant UVC components such as crowbar system, obsolete mode anode switching tetrodes and matching transformers.

Risks of Project: See Note [2]

N/A

Consequences of Not Doing Project: See Note [3]

If the proposed project is not undertaken, the Booster and Storage Ring rf systems will not be able to meet more stringent noise and jitter specifications and will continue to rely on a limited number of critical spares that are no longer manufactured. In addition, the health and safety concerns related to the operation and maintenance of existing mercury thyratron-based crowbar systems remains.

Cost/Benefit Analysis: See Note [4]

Failure to undertake this project will result in no improvement in rf system noise and jitter effects on beam and also having no viable short-term solution to the tetrode spares issue, when the remaining spares stock is depleted.

Description:

Procure and install a full voltage buck regulator, T/R set and controls/interlocks along with the existing DTI fast switch/mod-anode tank at RF1.

Risk Matrix Evaluation:
Impact 1 Likelihood 1 Risk 1

Funding Details

Cost: ($K)
Use FY08 dollars.

Year	AIP	Contingency
1	1469	200
2	226	40
3		
4		
5		
6		
7		
8		
9		
Total	1695	240

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		0.3			0.2	0.2		0.7
2		0.7		0.2	0.5	0.2		1.6
3								0
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.)