Title	***Linac Hot Spare for L4 and L5***			
Project Requestor	Michael Borland			
Date	March 21, 2008			
Group Leader(s)	Arnold, Nassiri			
Machine or Sector Manager	Nicholas Sereno			
Category	Accelerator Hardware and ID Improvements			
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:

The purpose of this initiative is to improve the reliability, stability, and flexibility of Linac operation. This will be done by implementing a hot-spare capability for L4 and L5.

Benefit:

More consistent delivery of beam to the PAR, particularly during top-up operation. Fewer problems with back-up modes, many of which are marginally functional now.

Risks of Project: See Note [2]

Low.

Consequences of Not Doing Project: See Note [3]

Possible inability to provide beam for several hours when a system fails and fallback modes are not available. Lower energy beam to PAR and booster, with consequent jitter and inconsistency.

Cost/Benefit Analysis: See Note [4]

Many of the components are of significant cost, but have significant benefit. Hence, cost/benefit is favorable.

Description:

A description of this proposal in the context of a general linac improvement initiative is avaialble in Section 4 of OAG-TN-2008-008.

Nominally, we should be able to operate with either L4 or L5 down. However, klystron output degrades over time, and this is a somewhat marginal situation. We propose to use the L6 klystron and modulator as a hot spare for L4 or L5, much as L3 is used as a hot spare for L1 and L2. This will help us maintain high beam energy in the event of a klystron or modulator failure. A water system will be needed for L6, which will also make L6 more useful as a testing station.

Funding Details
FY 08 $

Cost ($k)

Year	AIP	Contingency
1	187	18.7
2		
3		
4		
5		
6		
7		
8		
9		
Total	187	18.7

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		0.25		0.2	0.25	0.1		0.8
2		0.05		0.05	0.4			0.5
3								0
4								0
5								0
6								0
7								0
8								0
9								0

[1] **Notes:**

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.)