

Assumes delivery in 34 Months from Kick-off

Risk Identification							Risk Sort Data						Risk Analysis			Risk Marking							Risk Response			
Risk Number	Brief description of risk	Owner	Status	Management or Technical	Gemini Contingency?	Date identified	Performance effect	WP Delay (Weeks)	Cost of Risk (\$k)	Probability	Impact - Spec	Impact - Time	Impact - Cost	Max Impact	MARK P-1	Category	Risk triggers	Likely impact date	Avoid, Mitigate, Accept or Transfer (A, M, AC, T)	Risk Response Action	Cost of response \$K					
1	Exchange rate variations £ to \$ from assumption of \$1.85 to £ over life of project (variation over last 3 year = 20%)	PM	O	M	Y	Aug-06	N/A	N/A	250	3	0	0	5	5	15	H	Market forces		T	Gemini Contingency or agreement between PPARC and Gemini could be up to \$0.25M						
2	Consortium communication fails to work effectively	PM	O	M	N	Aug-06	Could have major impact if sub-system / icds between consortium members are not clearly communicated.	16	60	2	2	3	3	3	6	M	Multiple possible trigger point during project life time		M	The project team are experience in working in multi-national/time zone projects and will put in place a number of processes/tools to ensure good communication within the project team						
3	Telluric contamination might limit precision to a level higher than is required to detect earth-mass planets.	PI	O	T	Y	Aug-06	Cannot get adequate precision in RV survey	16	60	2	3	3	3	3	6	M	Modelling results or HET test data		M	Carry out more detailed modelling to establish if this is going to be a real problem. Test planned at Penn State HET will provide further info on this risks likelihood						
4	The orders and ref spectrum might be too close in the baseline 1x2 mosaic design.	IS	O	T	N	Aug-06	Cannot get adequate precision in RV survey	16	60	1	3	3	3	3	3	L	Modelling results		M	Carry out more detailed modelling to establish if this is going to be a real problem.						
5	First use of infrared arrays for ultra-high precision science - uncorrectable systematic effects in the detectors (e.g. residual image).	WPO	O	T	Y	Aug-06	Cannot get adequate precision in RV survey	16	60	2	3	3	3	3	6	M	Phase 1 of I&V array tests		M	Can run arrays colder than baseline plan of 70k i.e. at 40k						
6	Inflation rate increases / decreases from that specified at present	PM	O	M	Y	Aug-06	N/A	N/A	60	2	0	0	3	3	6	M	Consortium members Operating Plan cycles		T	Could work both ways, ask Gemini as contingency, 0.5% increase on rate throughout = +/- \$60K						
7	Thermal stability requirement not good enough to achieve 1 m/s RV goal	SE	O	T	N	Aug-06	Cannot get adequate precision in RV survey	24	140	2	3	5	5	5	10	H	Phase 1 of I&V thermal test		M	Carry out more detailed modelling to establish if this is going to be a real problem.						
8	Development RV code not available for I&V phase	IS	O	T	N	Aug-06	N/A	8	18	1	0	2	2	2	2	L	Phase 2 of I&V		AC	Monitor task in project plan						
9	Inflation calculation changes dependent on start date	PM	O	M	Y	Aug-06	N/A	N/A	60	3	0	0	3	3	9	H	Kick off		T	Will change baseline depending on start date - 6 month delay = \$60K						
10	Partner institutes don't approve pricing analysis	PM	O	M	Y	Aug-06	N/A	N/A	60	2	0	0	3	3	6	M	Pre-Kick-off		M	Ensure this proposal is good enough and has all bases covered, get draft MOU in place, Gemini support						
11	Science grade array fails during test	WPO	O	T	Y	Aug-06	Possible Cost and certainly delay as per WFCAM	16	400	1	0	5	5	5	5	M	Post - FDR array testing		T	Ensure strict adherence to cool down process instructions.						
12	Intrinsic stability of late M dwarfs might limit precision to a level higher than is required to detect earth-mass planets.	PI	O	T	Y	Aug-06	Cannot get adequate precision in RV survey	N/A	0	2	3	0	0	3	6	M	Commissioning phase		AC	Monitor results from other groups in field						
13	Consortium member fails to meet resource commitment	PM	O	M	N	Aug-06	N/A	8	0	2	0	2	0	2	4	L			M	Ensure MOU's between partners are clear and workshares are well defined.						
14	Work share split is not defined clearly enough	PM	O	M	N	Aug-06	N/A	8	0	2	0	2	0	2	4	L	Kick off		M	Ensure MOU's between partners are clear and workshares are well defined.						
15	Science requirements change/poorly defined and not prioritised in start up phase of project	SE	O	T	N	Aug-06	N/A	16	70	2	2	3	5	5	10	H	Science requirements not fixed by PDR		M	Ensure SE & Science team work closely to define top level requirements early in project						
16	Thermal stability requirement is not met	WPO	O	T	N	Aug-06	RV precision cannot be achieved	24	300	2	5	5	5	5	10	H	Phase 1 of I&V		M	More Detailed modelling. Change baseline design to improve thermal stability i.e. put instrument in temperature controlled room						
17	Mode scrambler/agitator does not achieve the required scrambling	WPO	O	T	N	Aug-06	RV precision cannot be achieved	16	25	2	2	3	2	3	6	M	PDR - completion of test being done at Penn State		M	Back up plan is to use a double scrambler - tests planned at Penn State						
18	Calibration process does not work - dynamic range of lines too high or not enough lines	WPO	O	T	Y	Aug-06	RV precision cannot be achieved	8	35	2	3	2	3	3	6	M	PDR - completion of test being done at Penn State		M	Test planned at Penn State will show if this is likely to be a real problem						
19	Fibre agitator significantly reduces life of cold fibre	WPO	O	T	N	Aug-06	Instrument reliability effected	12	35	1	2	3	3	3	3	L	Phase 1 of I&V		AC	Assess detailed analysis at major reviews						
20	Fibre pick-off is not stable enough	WPO	O	T	N	Aug-06	PSF distorted and throughput reduced	8	35	1	2	2	2	2	2	L	Phase 1 of I&V		AC	Assess detailed analysis at major reviews. Will be tested during I&V.						
21	Guiding stability cannot be achieved using FDAS	WPO	O	T	N	Aug-06	PSF distorted and throughput reduced	8	50	2	3	2	3	3	6	M	PDR		AC	Assess detailed analysis at major reviews						
22	A+G interfaces not well understood	WPO	O	T	N	Aug-06	N/A	4	20	2	3	1	2	3	6	M	PDR		M	Close out any areas of uncertainty with Gemini before PDR						
23	Failure to meet stray light specification	WPO	O	T	N	Aug-06	RV precision cannot be achieved	12	35	1	2	3	3	3	3	L	FDR		AC	Assess detailed analysis at major reviews						
24	Software interfaces are not understood	WPO	O	T	N	Aug-06	N/A	6	20	1	2	3	2	3	3	L	Software workpackage start delayed		M	Close out any areas of uncertainty with Gemini before PDR						
25	Vibration levels effect RV stability - dome environment (spec not met)	WPO	O	T	Y	Aug-06	RV precision cannot be achieved	8	35	2	2	2	3	3	6	M	FDR		AC	Assess detailed analysis at major reviews - Get Gemini to ensure vibration levels on Pier lab floor						
26	Optical alignment requirements difficult to set up & check	WPO	O	T	N	Aug-06	N/A	6	35	2	2	2	3	3	6	M	Phase 1 of I&V		AC	Assess detailed analysis at major reviews						
27	Image Quality - failure to meet specification	IS	O	T	N	Aug-06	PSF distorted , if gross effect RV measurement accuracy will be effected	12	70	2	2	3	3	3	6	M	Phase 2 of I&V		AC	Assess detailed analysis at major reviews						
28	Slow start due to resource availability	PM	O	M	N	Aug-06	N/A	8	70	3	0	3	3	3	9	H	Kick off		M	Ensure MOU's between partners are clear and workshares are well defined.						
29	Instrument throughput does not meet science requirement	IS	O	T	N	Aug-06	Survey takes longer than planned	24	100	2	2	5	5	5	10	H	Phase 2 of I&V		AC	Assess detailed analysis at major reviews						
30	Lead group assigned management responsibilities will have no control over effort or budget of collaborating institutions.	PM	O	M	N	Aug-06	N/A	8	35	2	0	2	3	3	6	M	Will apply throughout project lifecycle		AC	Ensure MOU's between partners are clear and workshares are well defined.						
31	Additional test equipment required for I&V (sub-system & instrument level)	WPO	O	T	N	Aug-06	N/A	10	50	3	0	3	3	3	9	H	FDR		AC	Assess in detailed at major reviews						
32	Major sub-contractor part fails to meet specification	WPO	O	T	N	Aug-06	Depends on component involved	16	70	2	3	3	3	3	6	M	Supplier Acceptance test		M	Ensure suppliers fully understand requirements and can demonstrate necessary technical capability.						
33	Science grade array damaged during handling	WPO	O	T	N	Aug-06	N/A	12	50	1	0	3	3	3	3	L	Phase 1 of I&V		M	Ensure strict adherence to handling process instructions.						
34	Gemini do not deliver their ICDs for new API system	WPO	O	M	Y	Aug-06	N/A	8	35	2	0	2	3	3	6	M	PDR		T	Close out any areas of uncertainty with Gemini before PDR						
35	Gemini do not meet their ICDs for DHS and Pipeline systems	WPO	O	M	Y	Aug-06	N/A	8	35	2	0	2	3	3	6	M	PDR		T	Close out any areas of uncertainty with Gemini before PDR						
36	Major optical items damaged	WPO	O	T	Y	Aug-06	N/A	24	350	1	0	5	5	5	5	M	Phase 2 of I&V		M	Ensure strict adherence to handling process instructions.						
37	Mechanisms fails to meet reliability requirement	WPO	O	T	N	Aug-06	Instrument reliability effected	12	70	2	3	3	3	3	6	M	Phase 1 of I&V		AC	Assess detailed analysis at major reviews						
38	Top level instrument specification not agreed / fixed	SE	O	T	N	Aug-06	N/A	6	35	1	2	2	3	3	3	L	PDR		M	Ensure SE & team work closely to define top level instrument requirements early in project						
39	Array supplier will not sign up to required specification	WPO	O	T	N	Aug-06	Risks identified in risk 5	4	20	3	2	1	2	2	6	M	Issue of array specification		AC	Work closely with supplier to try and ensure they understand need for additional specification requirements for PRVS project						

40	Specification given to supplier for major item incorrect	WPO	O	T	N	Aug-06	Depends on component involved	16	35	1	3	3	3	3	3	L	Major procurement exercises		M	Ensure process for procurement of high value items are followed	
41	Major cost increase for high value item when full specification issued for tender	PM	O	M	Y	Aug-06	N/A	N/A	120	3	0	0	5	5	15	H	Major procurement exercises		T	Contingency held by Gemini to cover this risk	
42	Supplier goes into receivership	PM	O	M	Y	Aug-06	N/A	12	50	1	0	3	3	3	3	L	Will apply throughout project lifecycle up to phase 1 I&V		AC	Carry out financial check for any company involved in high value item	
43	Major sub-contractor delivers late	PM	O	M	N	Aug-06	N/A	16	70	3	0	3	3	3	9	H	Supplier informing project of delay		M	Ensure project plan has reasonable float to cover this possibility	
44	Calibration Unit requires temperature stability to better than +/- 1 deg C	WPO	O	T	N	Aug-06	RV precision cannot be achieved	12	50	1	2	3	3	3	3	L	PDR		AC	Complete more detailed modelling to establish if this is a real problem.	
45	Cannot fit Fibre Deployment & Acquisition Unit electronics in A&G cabinet	WPO	O	T	N	Aug-06	N/A	8	35	1	0	2	3	3	3	L	PDR		AC	Locate electronics in pier lab	
46	Wavelength calibration resolution not sufficiently well know to give required RV measured accuracy	WPO	O	T	N	Aug-06	RV precision cannot be achieved	12	50	1	3	3	3	3	3	L	PDR		AC	Monitor work being done by other groups in this area	
47	Exceed Focal Ratio Degradation budget in Science fibre and / or fibre slicer	WPO	O	T	N	Sep-06	RV precision cannot be achieved	8	35	2	3	2	3	3	6	M	PDR		M	Prototype to test and if not acceptable use Bowen Walraven slicer	
48	Transmission efficiency of fibre slicer beyond 1 micron is inadequate due to wavlength leakage	WPO	O	T	N	Sep-06		4	35	1	2	1	3	3	3	L	PDR		M	Test will do done at PSU before PDR to check if the transmission is ok at 1 micron	