

MEMORANDUM

To: J. Gomez, K. De Jager

From: Pavel Degtiarenko

Subj: E04-018 radiation budget

cc: D. Skopik, A. Hutton, R. May, E. Abkemeier

Date: November 9, 2006

Radiation budget form for E04-018 experiment

The estimate for the boundary radiation dose from the **E04-018** experiment is given in the attached table. The input data have been provided by Javier Gomez. Please contact me if you see any misprints or inconsistencies in the table content.

The boundary dose accumulation due to this experiment is estimated to be about 6.2 mrem, below the annual design goal not to exceed 10 mrem yearly dose accumulation at the JLab boundary. However, the dose rate averaged over the run time is about 278% of the design average dose rate, higher than the alert threshold of 200%, which makes this experiment subject to further scrutiny.

The results should be discussed with Physics Division EH&S Officer prior to producing the Radiation Safety Assessment Document.

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RADIATION BUDGET FORM

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Exp. # E04-018

rev:

run dates: 2007

name of liaison: J. Gomez

setup number			1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	
beam	energy	GeV	0.687	0.687	0.687	0.817	0.817	0.817	0.915	0.915	0.915	1.056	1.056	1.056	1.199	1.199	1.199	1.337	1.337	
	current	uA(CW)	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0
exp't target	element		He3	H	Al	He3	H	Al	He3	H	Al	He3	H	Al	He3	H	Al	He3	H	
	thickness	mg/cm2	960	1416	614	960	1416	614	960	1416	614	960	1416	614	960	1416	614	960	1416	
	dist. to pivot	m	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
	Z		2	1	13	2	1	13	2	1	13	2	1	13	2	1	13	2	1	
	A		3	1	27	3	1	27	3	1	27	3	1	27	3	1	27	3	1	
cryo tgt window	element		Al	Al		Al	Al		Al	Al		Al	Al		Al	Al		Al	Al	
	thickness	mg/cm2	81	81		81	81		81	81		81	81		81	81		81	81	
	dist. to pivot	m	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
	Z		13	13	0	13	13	0	13	13	0	13	13	0	13	13	0	13	13	
	A		27	27	0	27	27	0	27	27	0	27	27	0	27	27	0	27	27	
critical window	radius	cm	3.125	3.125	3.125	3.125	3.125	3.125	3.125	3.125	3.125	3.125	3.125	3.125	3.125	3.125	3.125	3.125	3.125	
	dist. to pivot	m	1.25	1.25	1.25	1.25	1.25	1.25	1.25	1.25	1.25	1.25	1.25	1.25	1.25	1.25	1.25	1.25	1.25	
scattering weighting factor			0.50	0.50	0.50	0.50	0.50	0.50	0.50	0.50	0.50	0.50	0.50	0.50	0.50	0.50	0.50	0.50	0.50	
time	run time (100% eff.)	hours	21.8	1.1	1.1	65.5	3.3	3.3	218.2	10.9	10.9	436.4	21.8	21.8	87.3	4.4	4.4	240	12	
		days	0.9	0.0	0.0	2.7	0.1	0.1	9.1	0.5	0.5	18.2	0.9	0.9	3.6	0.2	0.2	10.0	0.5	
	installation time	hours																		
		days	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
dose rate at the fence post (run time)	method 1	urem/hr	1.80	1.89	1.61	2.18	2.07	1.87	2.50	2.22	2.09	2.82	2.29	2.29	2.82	2.12	2.24	2.84	2.00	
	method 2	urem/hr																		
	conservative	urem/hr	1.80	1.89	1.61	2.18	2.07	1.87	2.50	2.22	2.09	2.82	2.29	2.29	2.82	2.12	2.24	2.84	2.00	
dose per setup		urem	39	2	2	143	7	6	545	24	23	1229	50	50	246	9	10	682	24	
% of annual dose budget			0.39	0.02	0.02	1.43	0.07	0.06	5.45	0.24	0.23	12.29	0.50	0.50	2.46	0.09	0.10	6.82	0.24	

date form issued:

November 9, 2006

authors: P.Degtiarenko

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RADIATION BUDGET FORM

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Exp. # E04-018

rev: 0

run dates: 2007

name of liaison: J. Gomez

setup number			18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33		
beam	energy	GeV	1.337	2.194	2.194	2.194	3.261	3.261	3.261	3.287	3.287	3.287	3.920	3.920	3.920	4.328	4.328	4.328	totals:	
	current	uA(CW)	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0		100.0
exp't target	element		Al	He	H	Al	He	H	Al	He3	H	Al	He	H	Al	He	H	Al		
	thickness	mg/cm2	614	1240	1416	614	1240	1416	614	960	1416	614	1240	1416	614	1240	1416	614		
	dist. to pivot	m	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0		
	Z		13	2	1	13	2	1	13	2	1	13	2	1	13	2	1	13		
	A		27	4	1	27	4	1	27	3	1	27	4	1	27	4	1	27		
cryo tgt window	element		Al	Al		Al	Al		Al	Al		Al	Al		Al	Al		Al	Al	
	thickness	mg/cm2		81	81		81	81		81	81		81	81		81	81		81	81
	dist. to pivot	m		0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0
	Z		0	13	13	0	13	13	0	13	13	0	13	13	0	13	13	0	13	13
	A		0	27	27	0	27	27	0	27	27	0	27	27	0	27	27	0	27	27
critical window	radius	cm	3.125	3.125	3.125	3.125	3.125	3.125	3.125	3.125	3.125	3.125	3.125	3.125	3.125	3.125	3.125	3.125		
	dist. to pivot	m	1.25	1.25	1.25	1.25	1.25	1.25	1.25	1.25	1.25	1.25	1.25	1.25	1.25	1.25	1.25	1.25		
scattering weighting factor			0.50	0.50	0.50	0.50	0.50	0.50	0.50	0.50	0.50	0.50	0.50	0.50	0.50	0.50	0.50	0.50		
time	run time (100% eff.)	hours	12	21.8	1.1	1.1	21.8	1.1	1.1	261.8	13.1	13.1	196.4	9.8	9.8	196.4	9.8	9.8	1944.2	
		days	0.5	0.9	0.0	0.0	0.9	0.0	0.0	10.9	0.5	0.5	8.2	0.4	0.4	8.2	0.4	0.4	81.0	
	installation time	hours																		0
		days	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
dose rate at the fence post (run time)	method 1	urem/hr	2.21	3.80	1.64	2.24	4.31	1.52	2.41	3.49	1.52	2.41	4.56	1.48	2.50	4.71	1.47	2.56		
	method 2	urem/hr																		
	conservative	urem/hr	2.21	3.80	1.64	2.24	4.31	1.52	2.41	3.49	1.52	2.41	4.56	1.48	2.50	4.71	1.47	2.56		
dose per setup		urem	27	83	2	2	94	2	3	914	20	32	896	15	24	925	14	25	6166.1	
% of annual dose budget			0.27	0.83	0.02	0.02	0.94	0.02	0.03	9.14	0.20	0.32	8.96	0.15	0.24	9.25	0.14	0.25	61.661	
% of allowed dose for the total time																			277.83	
% of allowed dose for the run time only																			277.83	
<i>If > 200%, discuss result with Physics Research EH&S officer</i>																				

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