



U.S. DEPARTMENT OF
ENERGY



Tritium Experiment Readiness Review

charge items 6 and 7

Radiation Budget Estimate and Safety Document

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Hall A Safety Documentation

- Using Github to manage Hall A LaTeX Documentation:
<https://github.com/JeffersonLab/halla-osp>
 - COO: Conduct of Operations
 - ESAD: Experimental Safety Assessment Document
 - Hall A Standard Equipment Documentation
- RSAD done in collaboration with Radcon
- ERG – Emergency Response Guidelines
 - word document with map from facilities with labeled safety equipment
- OSP's by system owners

COO & ESAD

- Working forward from previously approved Hall A COO and ESAD documents (version control maintained with Github)
- Adding information about tritium and new training requirements COO & ESAD
- Adding information about students working in the Hall. This has been missing from experiment COO and added thanks to Ed Folts.

Radiation Budget Estimate

Energy	GeV	2.2	2.2	2.2	2.2	2.2	
Current		15.0	15.0	15.0	15.0	15.0	
Element		Be	Be	Be	Be	Be	
Thickness	mg/cm2	36.0	36.0	36.0	36.0	36.0	
Element		Al	Al	Al	Al	C	
Thickness	mg/cm2	160.0	160.0	160.0	160.0	100.0	
Element		H	D	T	3He		
Thickness	mg/cm2	50.0	120.0	75.0	75.0		
Time	days	1.0	6.0	6.0	6.0	1.0	
estimated							
Dose Rate	urem/hr	0.3	0.0	0.8	0.8	0.1	
estimated							
dose/setup	urem	6.0	0.0	121.0	121.0	2.4	250.3 urem total

Energy	GeV	4.4	4.4	4.4	4.4	4.4	
Current		15.0	15.0	15.0	15.0	15.0	
Element		Be	Be	Be	Be	Be	
Thickness	mg/cm2	36.0	36.0	36.0	36.0	36.0	
Element		Al	Al	Al	Al	C	
Thickness	mg/cm2	160.0	160.0	160.0	160.0	100.0	
Element		H	D	T	3He		
Thickness	mg/cm2	50.0	120.0	75.0	75.0		
Time	days	1.0	8.0	20.0	20.0	1.0	
estimated							
Dose Rate	urem/hr	0.5	0.9	0.8	0.8	0.1	
estimated							
dose/setup	urem	12.0	172.8	360.0	360.0	2.9	907.7 urem total

Energy	GeV	8.8	8.8	8.8	8.8	8.8	
Current		15.0	15.0	15.0	15.0	15.0	
Element		Be	Be	Be	Be	Be	
Thickness	mg/cm2	36.0	36.0	36.0	36.0	36.0	
Element		Al	Al	Al	Al	C	
Thickness	mg/cm2	160.0	160.0	160.0	160.0	100.0	
Element		H	D	T	3He		
Thickness	mg/cm2	50.0	120.0	75.0	75.0		
Time	days	1.0	1.0	10.0	10.0	1.0	
estimated							
Dose Rate	urem/hr	0.5	0.9	0.8	0.8	0.1	
estimated							
dose/setup	urem	12.0	21.6	180.0	180.0	3.1	396.7 urem total

Energy	GeV	11.0	11.0	11.0	11.0	11.0	
Current		15.0	15.0	15.0	15.0	15.0	
Element		Be	Be	Be	Be	Be	
Thickness	mg/cm2	36.0	36.0	36.0	36.0	36.0	
Element		Al	Al	Al	Al	C	
Thickness	mg/cm2	160.0	160.0	160.0	160.0	100.0	
Element		H	D	T	3He		
Thickness	mg/cm2	50.0	120.0	75.0	75.0		
Time	days	1.0	1.0	28.0	28.0	1.0	
estimated							
Dose Rate	urem/hr	0.5	0.9	0.8	0.8	0.1	
estimated							
dose/setup	urem	12.0	21.6	504.0	504.0	3.1	1044.7 urem total

Total Days: 152.0 days

Total Estimated Dose 2599.4 urem

The thickness single material in the beam is the Al walls of the target (160 mg/cm²)

Assuming 100% running, the maximum tritium runs could use is ~30% of annual dose budget.
(nominal running efficiency is ~50% so likely dose will be close to < 15%)

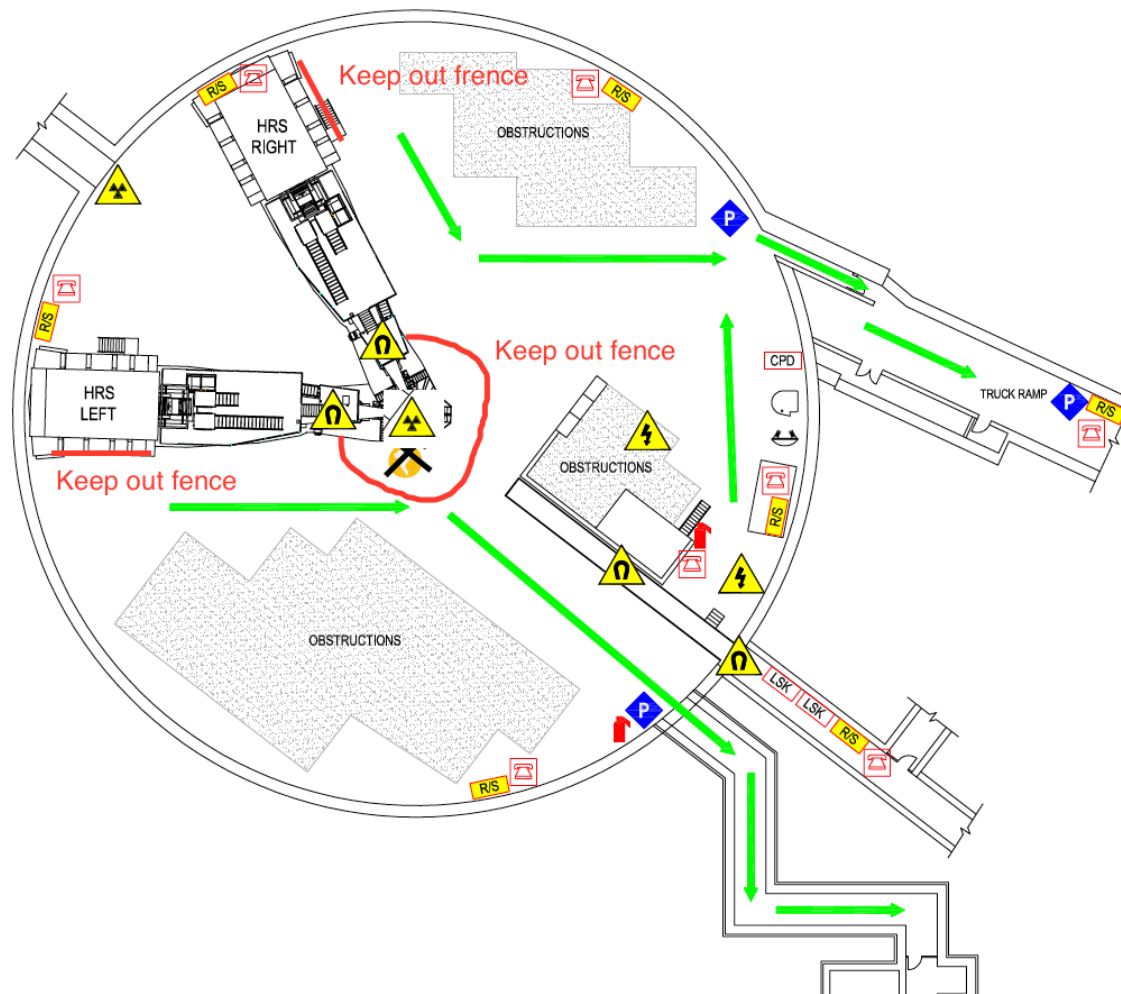
This is a lower luminosity experiment then the currently running DVCS experiments.



Emergency Response Guideline

DRAFT Hall A ERG Map For Tritium

**FOR HALL WORKER
AWARENESS TRAINING ONLY**



EXPERIMENTAL HALL A
BUILDING 101, FLOOR 1
EMERGENCY PLAN

IN CASE OF FIRE:

- STAY CALM
- WALK, DO NOT RUN
- ACTIVATE NEAREST PULL BOX, FOLLOW ARROWS IN DIAGRAM, & MEET AT MUSTER POINT

IN CASE OF SEVERE WIND:

IF A TORNADO WARNING IS ISSUED BY THE NATIONAL WEATHER SERVICE, AND JLAB IS WITHIN THE WARNING AREA, MOVE QUICKLY TO ONE OF THE DESIGNATED SEVERE WIND "TAKE COVER" AREAS.

LEGEND

- ➔ EGRESS PATH
- 🔥 FIRE EXTINGUISHER
- 🚒 FIRE ALARM PULL STATION
- ⚡ SEVERE WIND "TAKE COVER" AREA
- 🚪 MUSTER POINT
- ☎ TELEPHONE
- 🚪 R/S RUN/SAFE BOX
- 🚪 CPD CRANE POWER DISCONNECT
- 🚪 LSK LASER KILL BUTTON
- ⚠ MAGNETIC FIELD
- ⚡ ELECTRONICS / POWER
- 🚰 EYE WASH

Tritium Operational Safety Procedures

- Details of tritium target will be covered in the version controlled tritium target Operation Safety Procedure.
- Everyone working in Hall A will be required to review this OSP and take Tritium I training.
- CANS system will be used to ensure people have been trained (*Note: historically Hall A used the CANS system to control the hall during laser work*)
- Following the example of Radworker I vs. Radworker II, a Tritium II training will be used to train workers who will need to work with and/or near the tritium target.

Summary & To Do List

- Draft COO and ESAD Circulating
 - Added Tritium Information & Training Requirements
 - Added Information about students in the hall from Ed Folts
- Working on updating ERG
 - Updating Map with Tritium Target & Fences
 - Adding Information about Tritium Alarms & Contacts
- Working with Radcon to finalize RSAD documentation
- New OSP Document & New Training In Progress
 - Tritium Target Operational Safety Procedure
 - Tritium I (general) and Tritium II (specialized) training