

Fermilab

Radiological Work Permit No. AD-20-144

Area Name

MI 30

Permit Type Job-Specific

Issue Date Sep 21, 2020

Issue Time 10:15 AM

Expiration Date Nov 30, 2020

Description of Work

MI-30 Cable Pulls as per attached ALARA plan.

Access Type

- Controlled Access
- Supervised Access
- Open Access
- Other - Secured Area
- N/A

Basic Work Area Conditions

Refer to General RWP

Additional Work Area Conditions

None

Area Posting

Radiation Area

High Radiation Area

Contamination Area

Time Limits

None

Dose Limits

See Attached ALARA Plan

Work Documents

None

Dosimetry Requirements

- None Required
- Dosimetry Badge
- Pocket Dosimeter
- Ring Badge
- Digidose
- See Special Requirements

Basic Training Requirements

Radiological Worker

Other Training Requirements

None

Portable Survey Instruments

- None Required
- LSM
- Ludlum 14C
- E140N/Portable Frisker
- Minimeter
- Teletector
- Bicron Analyst
- See Special Requirements

Minimum Personal Protective Equipment

- None Required
- Gloves
- Shoecovers
- Labcoats
- Coveralls
- Hood
- Eye Protection
- Respiratory Protection
- See attached instructions
- See special requirements

Additional Instructions

- Notify ESH&Q Prior to Work
- Rad Tech Coverage Required
- Review Survey Map
- Pre-Job Briefing
- Personal Frisk on Exit
- Survey & Label Materials on Exit
- Post-Job De-Briefing
- No Eating, Drinking, Smoking
- See Special Requirements

SPECIAL REQUIREMENTS

Work stops at collective dose as per ALARA plan. RSO or designee approval required before proceeding if work is stopped. Radiation Safety RCT(s) will conduct radiation safety surveys as necessary, and will provide supplemental dosimetry as necessary, provide instructions for placement. Take precautions to prevent the spread of contamination, wear PC as directed by the RCT. All activated components are assumed to be contaminated. Dispose of all PPE in Rad Bags.

Prepared By

Susan McGimpsey

RSO Authorization

DSO Authorization (as of 9/2020)

Names of Workers, Signatures, and Further Instructions

Name of Worker	Fermi ID	Worker Signature and Date
----------------	----------	---------------------------

Matthew Welsh	39274C	Matthew Welsh
Jeff Jones	39273C	Jeff Jones
Paul Seay	12630	Paul Seay
John W Brown	3775	John W Brown
Dale White	10017	Dale White
Paul Allcorn	3937	Paul Allcorn
Roshanda Spillers	11956	Roshanda Spillers

Further Instructions

None

RR-300 Area Cable Pulls ALARA

RWP AD-20-144
RR Ion Pump Cable Pulls as per ALARA plan.

Name	Dose (mRem)
ES&H	
Paul Sedory	0
Dale White	22
Electricians	
Matt Welsh	45
Jeff Jones	41
EE/Instrument	
John Brown	26
Paul Allcorn	22
Roshanda Spillers	
Total	171.0

Summary

9/21-10/5/20 Person-mrem for this job was 171

Note: Original ALARA was estimated at 41 mrem

The ALARA was amended to 82 mrem by Radsafety

However, the information given never accounted for the cables being connected near the Machine!

This dose was 61 mrem that was unaccounted for in the ALARA.

The main scope of this job was to run new cables to the RR and 900 Extraction Line in the MI 300 collimator region. Electricians were given two spools that turned out to be too short. As a result they had to come back to make those runs separately which resulted in an extra 18 mrem. As noted above these cables needed to be connected to the beamline Ion Pumps(IP) they were associated with. This turned out to be more difficult as expected. Some cables were run several feet away and had to be rerouted. Electricians are unfamiliar with the area so they got some locations mixed up with MI line. Communication from group organizing this work should have been better to help prevent this. There was some confusion with referencing locations on EE support list with actual locations. Some cables and or IPs are not well marked or labeled. Also, tunnel is dark because MI dept. has not addressed lighting situation in 300 area. Many lights are not working and have been in this condition for over a year. Over time as more lights go out and existing non-working lights do not get fixed the lighting problem is exacerbated! The nomenclature system for the 900 Line is a little different than MI/RR which also added to time figuring which locations were which. I got extra dose helping sort the confusion out. Add to all this in an attempt to minimize dose, cables run to machine were pre-terminated, unfortunately many of the terminations were the wrong style of connector so jumpers had to be made and installed adding extra time in the area. The cause of this was that some of the IPs are an older type requiring 5KV connectors that connect to a HV adapter. The newer style take the 10 KV termination. As stated previously the ALARA did not call for the disconnection of existing cables from IPs and connecting the new cables that were run. This aspect took considerable time. Other than that the job went well.

MI30 Cable Pulls Shutdown 2020

Original ALARA

All items presumed to be radioactively contaminated

Job Stop limit =

51.42 mrem (incl. 25% contingency)

Individual checkpoint =

100.00 mrem per person, and not to exceed 300 mrem per quarter

STEP	TIME hours	NUMBER OF PEOPLE	EXPOSURE RATE mR/hr.	TOTAL	DOSE RECEIVED mrem	COMMENTS
				ESTIMATED COLLECTIVE DOSE person mrem		
Pull RG58 cables from patch panel rack to machine						
1	Pull 10 cables at ~3.5k feet (~5m per 100ft)	2.91	2	6.60	38.412	
Terminate SHV connectors at patch panel rack						
1	Terminate 10 EE support cables at patch panel for service building (5m per connector)	0.83	1	2.00	1.666	
Connect cables at machine						
1	Terminate 10 EE support cables at patch panel to machine (1m per connector)	0.16	1	6.60	1.056	
					41.134	

AD-20-144 MI30 Cable Pulls Shutdown 2020

Corrected ALARA

All items presumed to be radioactively contaminated

Job Stop limit =

102.00 mrem (incl. 25% contingency)

Individual checkpoint =

100.00 mrem per person, and not to exceed 300 mrem per quarter

STEP	TIME	NUMBER	EXPOSURE	TOTAL		COMMENTS
				ESTIMATED	DOSE	
		OF	RATE	COLLECTIVE	RECEIVED	
	hours	PEOPLE	mR/hr.	person mrem	mrem	

Pull RG58 cables from patch panel rack to machine

1	Pull 14 cables at ~3.5k feet (~5m per 100ft)	3.00	2	12.00	72	102
---	--	------	---	-------	----	-----

Terminate SHV connectors at patch panel rack

2	Terminate 14 EE support cables at patch panel for service building (5m per connector)	1.20	2	2.00	4.8	5
---	---	------	---	------	-----	---

3	Terminate 14 EE support cables at patch panel to machine (1m per connector)	1.20	2	2.00	4.8	3
---	---	------	---	------	-----	---

	SubTotal				81.6	110
--	-----------------	--	--	--	-------------	------------

Connect cables at machine (Not listed as step in ALARA)

						61
--	--	--	--	--	--	-----------

	Total					171
--	--------------	--	--	--	--	------------

Post-Job Critique and Analysis

Should include comments on such factors as:

Written by: *Dale White*

Reviewed by: *Sue McGimpsey*

Doses actually received versus anticipated doses, whether ALARA goals were met, whether work procedures and controls were adequate, and suggestions for improvements

Summary

9/21-10/5/20 Person-mrem for this job was 171

Note: Original ALARA was estimated at 41 mrem

The ALARA was amended to 82 mrem by Radsafety

However, the information given never accounted for the cables being connected near the Machine! This dose was 61 mrem that was unaccounted for in the ALARA.

The main scope of this job was to run new cables to the RR and 900 Extraction Line in the MI 300 collimator region. Electricians were given two spools that turned out to be too short. As a result they had to come back to make those runs separately which resulted in an extra 18 mrem. As noted above these cables needed to be connected to the beamline Ion Pumps(IP) they were associated with. This turned out to be more difficult as expected. Some cables were run several feet away and had to be rerouted. Electricians are unfamiliar with the area so they got some locations mixed up with MI line. Communication from group organizing this work should have been better to help prevent this. There was some confusion with referencing locations on EE support list with actual locations. Some cables and or IPs are not well marked or labeled. Also, tunnel is dark because MI dept. has not addressed lighting situation in 300 area. Many lights are not working and have been in this condition for over a year. Over time as more lights go out and existing non-working lights do not get fixed the lighting problem is exacerbated! The nomenclature system for the 900 Line is a little different than MI/RR which also added to time figuring which locations were which. I got extra dose helping sort the confusion out. Add to all this in an attempt to minimize dose, cables run to machine were pre-terminated, unfortunately many of the terminations were the wrong style of connector so jumpers had to be made and installed adding extra time in the area. The cause of this was that some of the IPs are an older type requiring 5KV connectors that connect to a HV adapter. The newer style take the 10 KV termination. As stated previously the ALARA did not call for the disconnection of existing cables from IPs and connecting the new cables that were run. This aspect took considerable time. Other than that the job went well.

See page 2

Permit No. AD-20-144

Post-Job Critique and Analysis - Page 2

Should include comments on such factors as:

Written by: *Dale White*

Reviewed by: *Sue McGimpsey*

Doses actually received versus anticipated doses,
whether ALARA goals were met,
whether work procedures and controls were adequate, and
suggestions for improvements

Name	Dose (mRem)
ES&H	
<i>Paul Sedory</i>	0
<i>Dale White</i>	22
Electricians	
<i>Matt Welsh</i>	45
<i>Jeff Jones</i>	41
EE/Instrument	
<i>John Brown</i>	15
<i>Paul Allcorn</i>	26
<i>Roshanda Spillers</i>	22
Total	171.0