Human Performance Improvement #239

Title RWP violation at MC-1 experimental hall

Event Date 04/25/2019

Close Out Date 06/27/2019

Performed On Particle Physics Division

Led By Environment, Safety and Health Section

Department Manager Brendan Casey

Location MC-1

ORPS No

Incident Category Near Miss

Entered By Katie Swanson 05/07/2019 00:00

Updated By Bridget Iverson 07/14/2020 15:22

Incident Description During a routine inspection of the MC1 experimental hall during an access period (HB-key, not Controlled Access), the ESH Coordinator discovered that 5 users were inside the hall without the required dosimetry badges. They were all part of the same group installing additional insulation on the storage ring magnet. The dosimetry requirement was stated in the HB-key access RWP and all 5 personnel (who are rad worker trained) had signed the RWP that morning, but the nominal leader of the group had concluded that dosimetry wasn't required, since he knew that the quads and kickers were not operating at that time. He informed the others of that conclusion when one individual asked about the dosimetry requirement. The group lead had forgotten that the dosimetry requirements had been changed a few months ago and that badges are now required for any access to the hall, irrespective of what systems are or are not operating.

What Happened? The users were looking to apply thermal insulation to reflect sunlight to minimize the magnetic drift on the front of the vacuum chambers. They filled out a work request (see attached electronic logbook entry). They wanted to go in first thing in the morning because they wanted to complete the task while the kickers and beam were off; they knew the tracker was replaced the day prior, so they were in "shut down" mode (kickers were locked out). The personnel who entered the high bay area that morning read and signed the RWP. The group discussed the need for dosimetry and the lead told them it didn't apply because of the unique operational state of the High Bay. The last time the two lead users had entered under the same conditions was during Run 1, in which case dosimetry wasn't required unless the kickers and beam were on. For Run 2, requirements were changed to having to wear dosimetry all the time to cut down on confusion. The lead user normally enters the High Bay during controlled access to measure magnetic field. During Run 1, the RWP had to be signed every time you enter the High Bay. During Run 2, the RWP needs to be signed on a monthly basis. The lead user found this confusing. The operations managers agree there is confusion for users in regards to all of the changes that have occurred in between Run 1 and Run 2. The dosimetry requirement may have changed a month after the High Bay training had gone live. The ESH Coordinator called the PPD Operations Manager when the lack of dosimetry was discovered and all work was stopped, and Radworker training credits were revoked. That morning, a question was added to the interface for those who give out keys to the hall.

Immediate Actions Taken Following the discovery of the RWP violation, the DSO and RSO were contacted. Changes were made to the HB-key issuing procedure to require that the person issuing keys visually verify that everyone receiving a key is wearing their dosimetry badge. A sign was added to the access door reminding entrants of the requirement. .

Why Did It Make Sense At The Time The group lead and other users that had worked last summer during the same access conditions thought the same requirements applied and in their minds knew there was no radiological hazard during that kind of access condition.

Topic(s) Communication | Documentation | General Management | Radiological Protection | Training

Lead Reviewer Swanson, Katie 12372N (ES)

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Involved Person Casey, Brendan 14805N (PPD)

Involved Person Corrodi, Simon 37054V ()

Involved Person Flay, David 32368V ()

Involved Person George, Jimin 15723V ()

Involved Person Nguyen, Hogan 10339N (PPD)

Involved Person Tran, Nam 17882V ()

Involved Person Winter, Peter 15629V ()

Organizational Weakness Communication: An email was sent to all who took the HB hazardous awareness training. Email was sent but retraining was not required.

Organizational Interfaces: Some ESH requirements in non-hazardous conditions are based on complex analysis that aren't always communicated.

Planning and Scheduling: Users come in for short periods to perform work and not plugged in to Fermilab rules and culture.

Procedure Development or Use: The RWP dosimetry requirement caused confusion and RWP wasn't properly followed.

Work Practices: A lab wide problem exists where a person in charge of a task doesn't necessarily realize it or take responsibility for leading the group.

Error Precursor

Human Nature / Assumptions (inaccurate mental picture): Assumed same access conditions from last summer meant same requirements.

Human Nature / Complacency / Overconfidence: Overconfidence that requirements were the same when questioned.

Human Nature / Mental shortcuts (biases): Justified actions by using past summer work requirements.

Individual Capabilities / Lack of knowledge (mental model): Group lead rationalized not needing dosimetry instead of following new requirements.

Task Demands / Time Pressure: Work was performed outside of normal working hours due to beam schedule.

Task Demands / Unclear goals, roles and responsibilities: the group lead roles and responsibilities are unclear, specifically in this case, for ensuring the RWP was followed by the whole group.

Work Environment / Changes / Departures from routine: Changes in requirements and access terminology.

Work Environment / Confusing displays or controls: No dosimetry signage on door.

Causal Codes

Item ID	Causal Code	Narrative
101582	A3.B3.C01 Attention was given to wrong issues	Rather than relying on the RWP for dosimetry requirements, the task leader relied on past experience.
101582	A3.B3.C06 Individual underestimated the problem by using past event as basis	Personnel received an HB key and entered the hall without wearing dosimetry as required by the RWP. The users involved in this access do not routinely enter the hall. Keylogger checks for key requester's training completion, assumes the RWP is being followed and dosimetry will be worn to enter High Bay.
101582	A4.B5.C11 Changes not adequately communicated	Changes in requirements for access between Run 1 and Run 2. Sign was not posted on the door at the time of the incident and keylogger did not physically check for dosimetry.
101582	A5.B1.C05 Recent changes not made apparent to user	The users involved in this access do not routinely enter the hall. The last time these users entered the High Bay was under Run 1 requirements.
101642	A4.B1.C07 Responsibility of personnel not well-defined or personnel not held accountable	Its not clear how task leaders are designated for work being done by users and what the leader's responsibilities would be.

iTrack Items

Item	Responsible Person	Categroy	Item Title	Item Description	Item Due Date	Item Status	CAP	CAP Scheduled Date	CAP Close Date	CAP Title	CAP Description	CAP Resolution	CAP Status
101582	Swanson, Katie	Management Concern	Dosimetry was not worn by HB key requester	Personnel received an HB key and entered the hall without wearing dosimetry as required by the RWP. The users involved in this access do not routinely enter the hall.	25-APR-19	Closed	83417	25-APR-19	25-APR-19	add "wearing dosimetry" data field to keylogger screen		Key issuer now has to physically check a box in the key logging system that they have checked for dosimetry on the person requesting a key.	Closed
101642	Swanson, Katie	Management Concern	Team leader designation and responsibilities are not clear	Its not clear if the person who took the lead of the actual access group to do the task (access leader) had specific responsibilities related to leading the group.	20-DEC-19	Closed	83449	20-DEC-19	03-MAY-19	collaboration to reinforce 2060	2060 needs to be reviewed by the collaboration.	Brendan Casey gave a presentation to collaboration reminding users to assign task leaders and follow 2060. This is documented in the g-2 docDB.	Closed

Uploaded File(s) MC-1 RWP.pdf — Uploaded: 06/11/2019 10:57 by Katie Swanson RWP violation_Swanson.pptx — Uploaded: 10/01/2020 20:10 by Dave Baird Jr. logbook entry on work request names removed.pdf — Uploaded: 07/09/2019 09:13 by Katie Swanson task-managers_gm2 (002).pdf — Uploaded: 07/03/2019 06:14 by Katie Swanson