

Physics Department Incidents Log

Incident No.	2004 - 01	Date of Report:	8/18/04
Reportable/Classification:	Possible PAAA Violation	Date of Incident:	5/21/04
Status	ES&H Committee Final Report		
Groups Involved:	OMEGA		
Lead Investigator:	D. Lissauer		

Description:

The ES&H Committee accepts the description of the incident as presented in the Critique from the C-A Department (attached).

The focus of this Physics Department investigation is to review any deficiencies in the performance of Physics Department personnel and the potential for incidents in the Department resulting from those deficiencies. For this reason, this investigation will focus only on the failure of individuals to adhere to the work plan.

The C-AD critique cited two unreviewed activities as presented below.

1. A Potassium Chloride tablet was introduced into the experimental apparatus. The C-A department was unaware of the use of this chemical and its use was not included in any safety review.
2. During operation of the experiment, a power supply (2000V, 0.8 ma max) failed. A power supply was substituted (2000V, 20 ma max) by the experimenter. This power supply is capable of delivering more than 10 joules of energy, a maximum current exceeding 10 ma, and greater than 50V, any of which requires electrical safety training. C-A was not notified of this change, possibly a hazard to the researchers and the facility.

The Physics Department ES&H Committee in its investigation learned of a failure to adhere to the work plan, which led to a number of events that may have contributed to the observed contamination levels.

The group had developed a checklist of procedural steps necessary to remove the irradiated liquid argon (LAr) for radiological analysis before the information would be lost due to decay (short half-lives). This sequence of events was developed since there were a large number of steps that had to be taken and it was determined to be extremely important for the safety and integrity of the experiment. Some contingency was built into the plan since it was recognized that there could be some contamination, which would delay approval to enter the experimental area. To this end, the sequence was rehearsed several times including a 'dress rehearsal' with the health physicists at the C-A Department.

During the actual experiment, in addition to the unreviewed activities mentioned above, one individual proceeded to perform tasks out of sequence of the checklist. In particular, the fasteners holding on the cover of the LAr bath were removed prematurely. Fortunately, the lead experimenter, who was following the checklist, realized that the increased potential for spilling LAr, would result in increased radiological exposure (which would have been an ORPS reportable occurrence), and failure of the experiment. The Lead Experimenter took actions, also out of the work plan, to secure the liquid and minimize unnecessary exposure.

The frustration of the lead experimenter with the person who deviated from the work plan and that person's lack of appreciation of the current safety culture of the Department and BNL was communicated privately to line management.

The ES&H Committee interviewed the individual who removed the fasteners, added the potassium chloride tablet (without having it reviewed), and participated in the change of power supply. The individual acknowledged the lack of review for replacing the power supply with one that could generate more current (stating that the replacement supply was a type of supply that he has used many times in the past that he didn't see any problem using it) and the lack of review for the potassium chloride tablet (forgot to include it) and the 'mistake' of going out of sequence of the checklist (expressed that he was trying to remember all the things he had to do when he was able to go in but got them out of order). The individual dismissed these all as insignificant changes and did not acknowledge the potential for serious consequences. Even after some discussion, he still did not seem to understand or accept the significance of his actions.

As a result of the individual's actions, lack of understanding of their significance, and other privately given information relating to the individual's past performance, the ES&H Committee expressed serious concern about allowing this individual to participate in any further experiments involving hazards.

Root Cause: A3 Human Performance Less than Adequate (LTA)
B4 Work Practices LTA
C01 Individual's Capability to Perform Work LTA (Attitude LTA)

The individual failed to adhere to the well-developed and reviewed procedures. He also expressed a lack of appreciation of the necessity to do so dismissing the changes and procedural deviations as insignificant.

Contributing Causes: A4 Management Problem
B4 Supervisory Methods LTA
C01 Tasks and individual accountability not made clear to worker
C11 Assignment did not consider worker's ingrained work habits

There was a failure of Line Management to restrict an individual, known to have a cavalier view of safety, from an experiment where hazards were present regardless of his involvement in the original development of the concept and design of the experiment. Line Management did appoint another scientist to act as the lead experimenter to handle all the reviews and safety requirements, but did not ensure that a chain of command was established and followed.

Corrective Actions (Group):

1. Line Management will ensure that there is a proper and agreed upon chain of command in any experiment that, due to the hazards present, requires that a strict set of procedures be followed.
2. The Group Leader will meet with his group to impress upon them the importance of thorough safety reviews for all work, of developing and following procedures, and the consequences of not following procedures.

Corrective Actions (Department):

1. The Department Chair will ensure that the experimenter who failed to follow established procedures is fully aware that such behavior is unacceptable to the Department and is not permitted to function in this way again in the Department or at other facilities.
2. Group Safety Coordinators (GSCs) will be informed and there will be discussion of this incident at the next GSC meeting, Group Leaders will be briefed, and the Department will be informed of the incident at the next Department Meeting.

Lessons Learned:

Personnel whose lack of regard for proper safety practices can jeopardize experiments, fellow participants, and the department. Action must be taken as soon as it is discovered to keep non-conforming individuals from employing improper work habits.

Experiments that require a use of a detailed checklist due to the nature of an experiment must establish an effective chain of command that is accepted by all participants.

The above incident has been investigated and requires no further action.

S. Aronson, Department Chair

Date

S. M. Shapiro, ES&H Committee Chair

Date