

Physics Department Incidents Log

**Incident No.** 2006 - 04 **Date of Report:** 8/31/2006  
**Reportable/Classification:** Not reportable – STOP WORK **Date of Incident:** 8/09/2006  
**Status** ES&H Committee Final Draft  
**Groups Involved:** Omega, Radio Wave Detection of Ultra High Energy Cosmic Rays  
**Lead Investigator:** H. Takai

**Description:** During the Physics Department Tier 1 inspection on August 9, 2006, it was noted that 3 antennae were located at the very edge of the roof of Building 510, above the inner courtyard, without attachment to the roof. The Imminent Danger is that a person in the courtyard could trip over or become entangled in a cable and cause an antenna to fall onto them. The Department's immediate action was to determine that no one was below in the courtyard and disconnected the signal cables, dropping the cables to the ground. Locating the antennae on the roof was a violation of the ESR (PO2006-078). The placement of the antennae at the edge of the roof could only be accomplished by violating the "Fall Protection" Subject Area which forbids approaching within 6 feet of a roof edge without restraints.

2 GPS antenna and 1 Lightning Antenna were installed for the experiment in FY2003. The three antennae were repositioned by the PI, in full awareness of the violation of the ESR, to acquire lightning data during the storm of August 4th, 2006. This was the last chance for data collection for a student's project.

In separate incidents:

1. It was discovered, after the fact, that Cloud Chambers were being constructed without any safety review. The diffusion cloud chamber is a detector that was built during the QuarkNet workshop at Stony Brook to be used in High School classrooms and it is a reproduction of cloud chambers that the team has been using currently in classrooms. Tests were conducted during the summer to improve its efficiency.
2. Untrained and unauthorized visitors attempted to use a machine shop after the visitors were explicitly told that they could not use machine shops as part of their site specific training given by the Manager of ESH&T Programs (signatures for this training are on file). Visitors needed to use the drill press to finish the assembly of an antenna element for a project. Their use of the drill press was stopped by a BNL employee, not associated with the project. The drilling operation was completed by a trained technician.

**Root Cause: A3 - Human Performance Less Than Adequate**  
**B4 – Work Practices Less Than Adequate**  
**C02 – Deliberate Violation**

PI deliberately violated ESR in order to get data that would otherwise be lost.

**Contributing Causes: A4 – Management Problem (by PI)**  
**B3 – Work Organization & Planning Less Than Adequate**  
**C11 – Inadequate Work Package Preparation**

PI failed to plan for the taking of data during the storm in order to have instruments secured to the roof adequately and in proper position. Additionally, the PI did not include the cloud chamber work in his ESR. Finally, the PI did not adequately make provisions for the drilling of materials that resulted in workers trying to use the machine shop without authorization.

**Corrective Actions (Group):**

1. Lightning Detector Antenna – It will be placed it at ground level. If results are not satisfactory it will either be relocated to the Suffolk County Community college because of their relatively higher altitude as compared to BNL or its location will be determined and placed using proper work planning procedures in coordination with the Building Manager and safety personnel.
2. GPS antennas will be relocated at ground level.
3. Cloud Chamber - As far as studies they are now terminated. An addendum to the ESR will be submitted for future use and operation of cloud chambers.
4. Shop access - The PI has discussed the issue with the visitors. The PI has arranged for a properly trained and authorized technician to aid in the drilling operation.

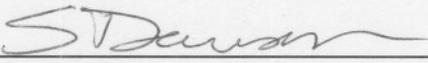
**Corrective Actions (Department):**

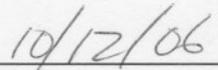
1. The Department Chair will address the deliberate violation and the lack of proper work planning with the PI in a manner that will ensure there will be no further violations.
2. The Department Chair will authorize the resumption of work at her discretion when she is satisfied there will be no further violations.
3. The Department Chair will correspond with the visitor who attempted to use the machine shop stressing the consequences of any further violation of Department or Laboratory rules.
4. This incident and in particular the lessons learned will be reviewed with Group Safety Coordinators at the next GSC meeting and with all Department personnel at the next all-hands meeting.

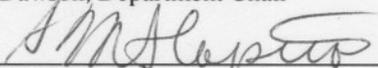
**Lessons Learned:**

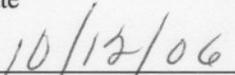
Failure to properly plan for experimental activities can lead to situations where experimenters will move outside the authorized safety envelope in order to get their work done. The risk increases greatly when summer visitors are involved as they are less familiar with the safety culture at BNL and the time they need to complete their summer projects is limited. As was seen in this incident, even employees who are well aware of the safety culture will also deliberately violate safety rules when in their judgment they can do so without harming themselves or others and the scientific value that would otherwise be lost seems worth the risk. Proper work planning involves the five core functions of Integrated Safety Management (ISM). In this case, the scope of the work was not properly planned and the PI went outside the authorized safety envelope. This incident review is also part of ISM in providing feedback for the researchers so that the next time work is planned the lessons learned will be incorporated into their work plan. This has wider application for the entire Department as other researchers may have found themselves in similar positions. The Department wants all its members to learn from this situation in order to prevent any future incidents.

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

  
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S. Dawson, Department Chair

  
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Date

  
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S. M. Shapiro, ES&H Committee Chair

  
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Date