Imperial College London

Reporting, Investigation, and monitoring of incidents

1. Introduction

The investigation of accidents and near misses is essential in determining the reasons for the incident and the corrective actions required to prevent reoccurrence. The time and effort dedicated to the investigation of an event must be proportional to the accident or near miss, and the potential consequences of the same or a similar event reoccurring.

2. Scope

This Standard Operating Procedure (SOP) applies to the investigation of all incidents reported across the College.

3. Roles and responsibilities

All staff and students are responsible for ensuring that all incidents are reported on the CORESTREAM system in a timely manner, so they can be investigated, and corrective actions identified and implemented.

Departmental staff are responsible for ensuring that the induction training related to the areas they manage contains sufficient information to enable staff to report incidents on the CORESTREAM system. There may be occasions when visitors will be asked to report incidents to Imperial staff to facilitate reporting onto the CORESTREAM system.

Departmental Safety Officers (DSOs) and Department-based Safety Staff (where these are in place) would have additional responsibilities.

Faculty Safety Advisors (or equivalent) are responsible for ensuring that all incidents are investigated and closed once the root cause(s) and corrective action(s) have been identified, implemented, and documented on CORESTREAM. The corrective actions should be clear and terms like 'will consider' must not be used. The **College Safety Department** receive all CORESTREAM notifications and will participate in the investigation of the more serious incidents (see section 5 below).

The Safety Department is responsible for:
- Leading or supporting the investigation of high-profile incidents, as agreed with Faculty Safety Advisors upon receipt of a CORESTREAM report.
- Providing training on how to conduct investigations
- Monitoring the status of the events reported
- Identifying trends in reporting that could trigger changes to policy and procedures, additional training requirements, etc.
- Reporting significant trends to the relevant committees, e.g., H&S forum, Operations Committee, and the Risk, Compliance and Ethics Committee
- Monitoring compliance with this SOP

4. Reporting of incidents

Incidents that must be reported on CORESTREAM and require investigation are:

- Any accident resulting in physical injury or ill health to a person while undertaking any task at work (for staff), or place of study (for students). This includes field work and other types of off-site work.
- Any undesired event or condition where no injury, ill health, or damage occurs, but there was the potential for it to occur.
- Where property or equipment is damaged or some other form of loss occurs, but no injuries are sustained.
- RIDDOR reportable dangerous occurrences which are serious incidents including failure of lifting machinery or pressure vessels, explosions, and unplanned releases of biological or radiological agents.
- Incidents which do not cause injury or ill health, but which are reportable to an enforcing authority such as the HSE, EA, Police or DEFRA.
- Unplanned or uncontained release of hazardous materials outside of primary containment

5. The Investigation process.

The investigation of incidents involves the analysis of all the information available; physical (the scene of the incident/equipment), verbal (accounts of witnesses) and written documentation (risk assessments, procedures, instructions) to identify what went wrong and determine what steps must be taken to prevent the event happening again.

The time dedicated to the investigation must be proportional to the seriousness of the incident reported and its potential safety impact and consequences.

Faculty Safety personnel (or equivalent) receive notification of all CORESTREAM entries relevant to their areas and will determine the seriousness of the event. Different Faculties have different arrangements for determining who conducts the investigations, this being defined at Faculty level.

The Safety Department receives notification of all CORESTREAM entries and will coordinate, with Faculty Safety Advisors, local personnel, and others as required, for the investigation of serious accidents and near misses.

When investigating an event, it's always good practice to involve:
- ✓ The manager of the person affected/involved
- ✓ The manager of the area where the event took place
- ✓ The person affected, if available. Do not delay investigations if the person is absent following the incident. It is best to conduct the investigation while the facts are fresh in the memory of any witnesses.
- ✓ Departmental Safety Officers and College Safety Department, as applicable.
- ✓ Other staff members who may be able to help clarify the cause(s) of the event and/or identify corrective actions.

All incident investigations will:
- ✓ Establish the immediate, underlying and root causes of the issue reported
- ✓ Ensure that where actions are needed, appropriate corrective actions are identified to eliminate the cause and prevent reoccurrence
- ✓ Ensure that corrective actions are appropriate to the nature and risk associated with the cause

✓ Ensure that corrective actions are allocated to a named individual with the resources to implement them in a timely manner; this must be defined within the investigation report.
✓ Ensure that corrective actions are monitored to ensure they are effective.

Where the incident reported is of such a nature that the root cause and actions identified cannot be clearly documented on CORESTREAM, an investigation report will be produced using the template F-017- Investigation report template, also included in Appendix 1 of this SOP.

5.1 Investigation of minor accidents and low impact near misses
Included under this category are items such as:
- Falling small and lightweight debris from height.
- Spillages on floors where hazardous materials could be transported.
- Minor trips, cuts, grazes etc.

The investigation of minor accidents and low impact near misses will be investigated at Faculty level. The root cause of the incident and any corrective actions should be identified, and the findings of the investigation recorded on the CORESTREAM system no later than **four weeks** from the time the incident was reported. The writing up of a separate investigation report would not routinely be required for minor accidents and near misses. The CORESTREAM entry must not be closed until all corrective actions identified have been confirmed as implemented. Faculties and Departments have different mechanisms for keeping track of the status of corrective actions and this will be managed at Faculty/Departmental level.

5.2 Serious accidents and high impact near misses
Included under this category are incidents such as:
Someone being exposed to HG2 or HG3 biological agents.
- Failure/malfunctioning of safety critical control systems.
- Accidental release and/or exposure to gases or significant release of cryogens and acutely toxic chemicals.

Where a serious malfunction involving methodology or equipment is suspected, immediate appropriate measures must be taken to ensure that the area/equipment is not used until appropriate corrective actions have been implemented, and where appropriate, validated or verified as effective.

Based on the information available at this stage, **immediate actions** will be identified and implemented so the issue is controlled, and no further harm is inadvertently caused by the incident.

In some cases, the Safety Department may need to be notified before the CORESTREAM report is completed. This is because the police/HSE/EA etc need to be notified immediately or without delay.

Always cooperate with the police and Regulators if they are involved and follow their instructions. Do not release information to the public.
A lead investigator must be nominated. This will be an independent individual who is not directly involved in the work.
The following steps should be followed:
   1. **Gather information**:

Find out what happened, where it happened, what conditions and actions influenced the adverse event. Collect available and relevant information: risk assessments, Codes of Practice (CoPs), SOPs, training records, maintenance records, etc. AND factual witness statements, minutes of investigation meetings, etc. photographs, etc. If it is not possible to conduct the witness interview immediately, witnesses should be advised to write a statement before discussing the events with anyone, and ideally asked not to discuss the event until the interview has taken place.
Determine the sequence of events and timeline. If the area is covered by CCTV, it's useful to request access to the footage as this will provide a factual insight into the event, and in a timely manner, as it could be overwritten otherwise.

2. **Analyse the information gathered:** the analysis involves examining the facts, determining how they contributed to the event and why. Analysing the information will also help identify evidence and data that is missing. As part of the analysis, it is essential to identify the root cause(s) that lead to the event. For complex investigations, it may be necessary to establish sequences for parallel events and contributory factors. Note: keep an open mind when exploring the causes that lead to the incident and only discount a possibility when the established facts rule out that option. All explanations explored, including discounted factors, must be documented, and justified.

3. **The action plan and its implementation:** The action plan should cover all different explanations found that could have led to the incident, the root causes agreed upon and the corrective actions required to prevent reoccurrence.

Note: there must only be one investigation report for any incident, which is both factual and objective, and hence fit for circulation to all relevant parties. The report issued must be labelled as "for review" or "final", as relevant.
The final copy of the report will be uploaded to CORESTREAM.

5.3 Root cause identification
Incidents are rarely the result of a single immediate cause (unsafe act or condition). Each incident is a learning opportunity that could be wasted if the true underlying cause(s) of the incident, and the root cause(s) are not identified and addressed. Underlying causes tend to be the reasons for the unsafe acts or conditions. Unsafe acts and unsafe conditions are almost always the result of underlying failures, e.g., lack of proper information or training, unsafe systems of work, poorly maintained or unsuitable equipment, poor planning, unclear responsibilities, poor supervision. Root causes tend to be systemic failures in management control and/or the safety management system and should be identified and eliminated through process improvement.

The "5 why" investigation approach is a useful tool to identify the root cause of an incident. The basic approach is to gather information on an incident and form a team. The team then asks why the incident occurred, referring to the information available to answer the question. The team should reach a point where asking "why?" no longer makes sense, either because a root cause has

been found, or there is no further sufficient information to ask the question. This can take more or less than five "why" questions; it can also be phrased in other ways: "how is that", "what affected this". This method is useful for simpler investigations where it is believed that only a small number of factors contributed to the incident. It's useful to draw a timeline, trace back the events leading up to the incident and write on the timeline the reasons that the team believe each event occurred.

For more complex investigations, it may be necessary to establish sequences for parallel events and contributory factors. A fishbone diagram, and the 'effect and causal factors analysis' (ECFA) are useful tools in these instances.

There are three basic types of root causes that can have a potential impact on an issue:

- **Physical causes**: these include issues related to equipment suitability or malfunction, environmental conditions such as lighting, noise, etc.
- **Human causes**: related to human factors caused by lack of skills and knowledge to perform a task. Human errors do not arise because of carelessness or lack of attention. An incident very rarely is a person failure. See appendix 2 for more details on human factors.
- **Organisational causes**: The system surrounding the processes and tasks, including their management, are to be interrogated in order to understand where, why and how they failed.

6. Monitoring of incidents

All reported incidents will be discussed with Faculty Safety Advisors monthly until they are satisfactorily resolved and closed on the CORESTREAM system.
Serious incidents should also be monitored via the Departmental Safety Committee for the area.

7. Version History

Version no.	Effective date	Approved by	Description of key changes
1.0	03/03/2023	Surrinder Johal	Document creation, consulted and commented on by Safety Department.

8. References

HSG245(2004)- Investigating accidents and incidents (last accessed on 28/11/2022)
HSE Root causes analysis: literature review, published in 2001

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Appendix 1- Investigation report template (F-017) **Investigation report- IN**

(enter CORESTREAM reference)

1. **Executive summary**
   Brief description summarising the incident, the number of people exposed, the immediate, underlying and root causes identified. Brief overview of the actions agreed and the estimated implementation time.

2. **Background information**
   Enter overall description of the work normally conducted in the area where the incident took place and the relevant controls in place to manage the risk associated with the activities conducted in the space.

3. **Chronology**
   Timeline of what happened on the day, including immediate actions taken, where applicable, any aspects leading to the incident, where relevant.

4. **Investigation**
   Explain the different aspects that could have contributed to the incident and their role (if any) on the day when the event took place.
   Documentation to review may include:
   - Risk assessment for the activity and associated SOPs.
   - Code of practice for the laboratory, facility, or both, as applicable.
   - Service records, including planned preventative maintenance records, logs, etc.
   - Training, local induction and competency records.

5. **Root cause(s) and corrective action (s)**
   Based on the findings from the investigation, list the root cause(s) that led to the incident and the corrective action(s) to be implemented in the table below.

Root cause	Corrective action(s)	Owner	Completion date

Appendix 2 – Human Factors

We can all make mistakes irrespective of how much training and experience we have or how motivated we are to do things right.

In general, either **active failures or latent conditions** can give rise to mistakes; Active failures are acts or conditions that bring about the situation and usually involve front-line staff, and the consequences of these are usually immediate. Latent conditions, however, are managerial influences and social pressures that make up the local culture (i.e., 'the way we do things around here'), they influence the design of equipment or systems, and define supervisory conditions. These conditions are often not visible until triggered by an event.

People can cause or contribute to an event in a number of different ways:
1. _physical errors_ – unintentionally not doing what they were meant to do.
2. _mental errors_ - doing the wrong thing believing it to be right.
3. _misinterpretation_ - situations can be misinterpreted resulting in inappropriate actions being taken.
4. _intentional deviation_ where individuals knowingly take short cuts or do not follow known procedures. People can make disastrous decisions even when they are aware of the risks.

NOTE: People can often be 'set up to fail' by the way the human brain processes information, by poor training, through poor design of equipment and procedures and even through the local/organisational culture.

When a safety event involving human error is reported, the subsequent investigation into the causes and contributory factors should always attempt to understand **why** the human failure occurred. Finding out both the immediate and underlying causes is the key to preventing similar events occurring again.

The next step is then to identify the factors that make the failure more likely to occur again.

Performance influencing factors (PIFs) are the characteristics of people, tasks and organisation that influence human performance and therefore the likelihood of human error occurring. PFIs include time pressure, fatigue, poor design of controls and the quality of operating procedures. Therefore, during the investigation give consideration to three key parameters that have the greatest impact: job, individual and organisational & management factors. Typical examples of potential failing for each category are given below:

- Job factors
  - Poor design of equipment and processes
  - Constant disturbances and interruptions
  - Missing or unclear instructions
  - Poorly maintained or calibrated equipment
  - High workload
  - Noisy and unpleasant working conditions

- Individual factors
  - Low skill and competence levels
  - Tired staff
  - Bored or disheartened staff
  - Individual medical problems

- <u>Organisational & management factors</u>
    - Poor work planning leading to high work pressure
    - Inadequate responses to previous incidents
    - Poor or one-way management communications
    - Poor supervision
    - Deficient co-ordination and responsibilities
    - Poor safety awareness and culture