



HEALTH AND SAFETY IN THE LABORATORY SERIES

STANDARD OPERATING PROCEDURES (SOPs)

Your facility should be committed to complying with applicable federal, state, and local regulations on hazardous chemical usage, pollution prevention objectives, and to continual improvement of environmental systems. To achieve this goal, you should adhere to compliance with applicable environmental laws and regulations, educate and train your staff to properly implement procedures, reduce and minimize your impact on the environment, and monitor your adherence by performance measurements.

Formation of a Safety Committee

First, a safety committee should be formed. The committee will write, review, implement and update all health and safety documents and policies that address all laboratory safety processes/functions. Policies and procedures should include Health and Safety Policies, which contain a laboratory safety plan.

Laboratory Safety Plan

The plan should cover all aspects of laboratory safety, such as how chemical waste is accumulated, collected, disposed of, personnel protective equipment, special handling procedures, biological waste management, sharps control, chemical spill emergency response, pollution prevention, and educating and training of staff on proper chemical laboratory management.



Writing Standard Operating Procedures (SOPs)

SOPs play an important role in the laboratory QMS system. SOPs improve output consistency and efficiency. An SOP is a process document that describes how an operator should perform a given operation in detail. The objective of SOPs is to ensure that all workers are performing tasks in the same way, which is a necessary condition to obtain consistent output from the process (Doak & Assimakopoulos, 2010, p.172). When selecting, verifying, and validating methods, standards based on validation studies, are to be written so that the operating personnel in a laboratory can use them.

Additionally, within a quality management system (QMS), many forensic science practitioners use implicit and explicit experience and knowledge when working in a laboratory. Some may not rely on standard operating procedures (SOPs). To assist and tackle this trend, accreditation bodies may require the witnessing of

procedures within your laboratories scope. This enables the practitioner and the guardians of the QMS to understand better when policies and procedures need to be updated or changed. There must be a balance between the two types of knowledge required for the forensic scientist, explicit and implicit knowledge. When a practitioner makes adjustments in a laboratory process due to their implicit knowledge, the SOP, the explicit document, should be adjusted if the change is noteworthy. Therefore, when the laboratory safety plan includes health and safety policies and procedures, updating and reviewing SOPs is paramount.

Examples of SOPs would be the operating instructions of laboratory equipment and the use and disposal of chemicals streams. For example, some laboratory processes create chemical waste streams containing halogenated solvents such as methylene chloride and non-halogenated solvents such as methanol and acetone. Other flammable chemical waste streams are chemicals used in fire debris examinations and acids and bases, such as hydrochloride acid and ammonium hydroxide, respectively.

Chemical waste stream SOPs should be included in the laboratory waste management policies/section within the Laboratory Safety Plan. The policy would discuss how the chemical(s) was handled, collected, and disposed. In this example, using a standard operating procedure (SOP) template will help your lab address the safety requirements that staff must follow when using laboratory solvents.

Different Types of SOPs

There are technical and administrative SOPs. The way it is presented/written is dependent on the subject. For example, a technical SOP is required for instrumentation. Examples would be an SOP for microscopes, fume hoods, chromatographs, and spectrometers including equipment used for specific forensic analysis, like cyanoacrylate fuming chambers for lifting latent fingerprints, alternative light sources, and cameras. The SOP would include all elements needed for a laboratory worker to operate the instrumentation.

However, administrative SOPs would include purchasing procedures, access control, emergency procedures, hazardous waste policies, and personnel issues. Some, but not all administrative SOPs would be included in a laboratory safety plan.

Examples of different SOPs:

[Flammable Solvents SOP.pdf](#)

[Laboratory Housekeeping SOP -LSU.pdf](#)

[Drying Oven SOP- IOWA STATE.pdf](#)

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References:

Reference:

McMaster University EHS
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Doak, S., & Assimakopoulos, D. (2010). Tacit knowledge: A needed addition to SOPs in a forensic science environment. *Forensic Science Policy and Management*, 1(4), 171-177.