



Drilling Technology Lab [DTL] Management System

Version 1.4

May 07st, 2019



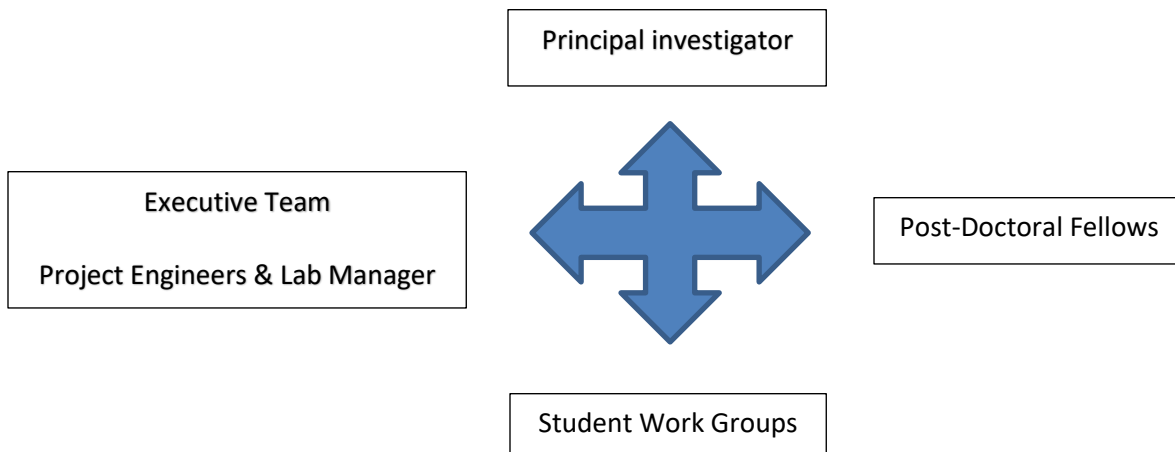
Contents

Contents.....	2
Introduction	3
Organization structure	3
Lab safety	4
Safety inspections	4
Lab permit system.....	5
Computers and printers	5
Appendix A: Lab permit and observation report forms.....	7

Introduction

This system is put in place to manage and track equipment usage and safety incidents within the Drilling Technology Lab Research Group. This document describes the organization structure of the group, the documents used to plan research activities, gain access to equipment, and report safety incidents internally within the group. It also describes a general guideline for optimizing research work to help students plan their work efficiently.

Organization structure



The head of the organization is the principal investigator, he is supported by an executive staff that are in charge of lab safety, project planning, tracking research activity and equipment usage, material procurement, and contact with technical services and facilities management.

A group of post-doctoral fellows is in charge of supporting research work, and overcoming technical difficulties based on their technical backgrounds.

Student work groups are the building blocks of the research group. The organization aims to make student research as efficient as possible to help students publish their work and graduate within the proposed time of their program.

Lab safety

Safety of personnel, students, equipment and the environment is the responsibility and top priority of everyone involved with the research group.

Access to the lab will be granted as soon as you attend the mandatory safety orientation as per university regulations.

For your own safety, you must never work without a lab partner. You also must never operate any equipment unless you had the proper training to use it, and have reviewed the latest version of its manual. Drilling equipment in the lab are high power equipment and can cause injury if not used properly. If you need to work on weekends you must notify the principal investigator, lab manager and campus enforcement.

Work in the facilities must be pre-authorized by the executive team by a principal investigator approved research plan and a lab permit that is approved by a project engineer and the lab manager.

The lab group follows a no blame safety culture.

- If you see anything that is out of place, or anybody performing an unsafe act such as operating equipment without permission, not using the proper personal protective equipment [PPE], or working without a lab partner, you must intervene immediately to prevent injury, damage to equipment, or the environment.
- You are encouraged to file an observation report documenting the incident without referring to names, so the executive team can monitor and adapt to safety issues, and implement strategies that will prevent future incidents based on the lessons learned from the observation reports.

Safety inspections

The executive team will perform a monthly safety inspection of the labs, office spaces, and storage areas. The findings of the inspection will be reported to the

principal investigator along with lessons learned from the month's observation report and recommend actions to mitigate future incidents.

Lab permit system

The lab permit system allows the executive team to track usage of equipment and research progress. If your research requires the use of any of the equipment download the lab permit form from the DTL website, fill out the research plan section of the permit and have it approved by the principal investigator.

After the research plan is approved the project engineer in charge of your area of research or the lab manager will assist you with filling out the rest of the permit.

Once the permit form is completed and authorized, two copies of the permit are made, one is to be displayed on the door of the lab as long as the permit is active and the other is to be kept by the lab manager.

Once your work is complete the permit must be closed by the lab manager and entered into a database to be retrieved if needed.

Computers and printers

When you join the DTL research group you are given a desk space in one of our office spaces. The office space comes with a desktop computer and access to a network printer. You are responsible for the desktop computer, if you experience any problems with the computer, open a ticket with engineering computer services [ECS] by either visiting their online ticket system or by visiting their office on the third floor of the engineering building in room EN 3020. If you notice that the printer is running out of ink, please inform the executive team to replace the toner cartridge.

Research meetings and progress reports

The DTL research group holds a weekly meeting that starts with a graduate seminar. Students are required to present on their literature review or research work once every semester. The first seminar every semester is reserved for the



executive team members. During the executive seminar a sheet will be circulated for students to select the date they want to present on.

Research progress reports are presented by the students on biweekly basis. After the seminar is concluded, every student will have a short 15-20 minutes meeting with the principal investigator and the executive team to review progress and plan future work.

The weekly meeting is the best time to get your planned experiments and lab permits approved.



Appendix A: Lab permit and observation report forms



Lab Permit



Date: _____

Permit number: _____

Permit Initiator (Name/Student Number/Email): _____

Lab partner during work: _____

Part A: Scope of work

1- Purpose of work: Teaching Research Other _____

2- Start time & estimated duration: _____

3- Equipment Required: _____

4- Bit type: _____ Bit Serial Number: _____

5- Summary of work to be done: _____

Part B: Safety precautions

1- Risks involved in the proposed work: _____

2- PPE to mitigate risks:

Steel Toe Shoes Lab Coat Coveralls Safety Glasses

Face Shield Gloves Apron Dust Mask

Hard Hat Other _____

Part C: Validity & Approvals

This permit is valid for the designated time slot only, if work is not completed within the timescale a new permit must be issued.

Permit Initiator Requestor's Partner Project Engineer Lab Manager

Part D: Completion/Suspension of work

I confirm that the work has been completed in accordance with this permit. The lab has been restored to its original state and the work area is ready for the next users.

Work was not completed as per plan, a report of what went wrong and a new permit will be submitted next meeting. The lab has been restored to its original state and the work area is ready for the next users.

Permit Initiator End Date Lab Manager



Lab Permit



Part D: Research Plan

Principal investigator

Safety procedures for drilling technology lab

1. Use the adequate PPEs to your activities.
2. All activities in the drilling lab must be performed with at least one partner.
3. Make sure you are familiar with the operations procedures as stated in the DTL manual
4. Do not operate the equipment unless you have been trained by an authorized trainer for the specific equipment
5. For drilling experiments make sure that the bit is properly seated in the drilling sample before applying full drilling parameters. Bit seating is performed as follows
 - a. With a low rotary speed setting apply a low weight on bit value and start drilling in a very controlled ROP
 - b. Continue drilling until the bit cutters are fully engaged in the rock sample
 - c. When the bit is sufficiently engaged start applying your required drilling parameters by slowly increasing the WOB in fixed increments
6. For SDS experiments make sure you follow the Flow rate calibration procedures from the DTL manual
7. For geo mechanics frame experiments:
 - a. Apply the axial load in a constant rate of application to make sure you have a proper graph
 - b. For CCS experiments make sure the confining stress is applied in a rate that is proportional to the axial load application rate
8. For the triplex pump
 - a. Make sure that the valves are lined up properly to avoid applying high pressure from the pump to city water supply
 - b. When using the city water supply for atmospheric experiments, be aware that the flow rate will change with variations in back pressure
9. For the high pressure cell experiments please review the standard work instruction for assembly, disassembly and operation.
10. After you complete your experiments:
 - a. Clean the equipment, tools, etc.
 - b. Return the tools, equipment, and components to its correct storage place.
 - c. Turn off the equipment that you used.
 - d. Report the best practices used in your experiments (notes, pictures, schemes, etc.)
 - e. Report the bit conditions (wear, damages, bit bearing, etc.)
 - f. Report if there is any equipment and/or tools damaged, leaks, etc.
 - g. Report any unsafe conditions.

Permit Initiator

Requestor's Partner



Observation Report



Date:

Incident Location & Description

Action Taken

Lesson Learned

Reported by
