

Welcome to course in Health, Safety and Environment (HSE)

Faculty of Natural Sciences (NV)

HSE at NTNU and NV-faculty:

HSE-advisor Espen Fjærvik

First aid and fire protection:

Midt-Norsk Sikkerhetsopplæring AS (MINSO)

Health, Safety and Environment at NV

Important objectives:

- Ensure a safe working environment and prevent accidents and injuries.
- Ensure that all leaders, employees, and students **know their HSE responsibilities** and have the **knowledge** and **attitude** needed to take care of these responsibilities
- Include knowledge and awareness of HSE as an **important part of the education and research** at NV.



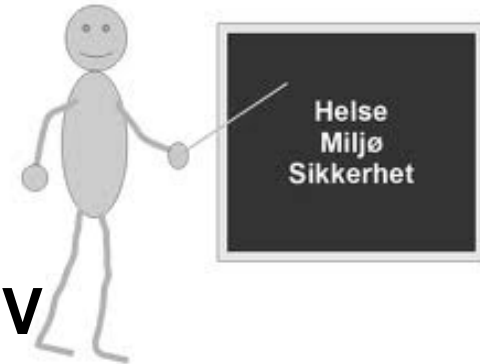
HSE training at NV-faculty

Main objective:

- Ensure that employees and students are given the necessary training in HSE to have a safe working environment

This course deals with:

- General HSE conditions at NTNU and NV
- First aid and fire protection



Specific HSE training for laboratory work is given at the departments

Schedule HSE-course

Schedule for HSE course (HMS0003) Friday 16 August 2019			
Time	Place*	Activity	Groups
08:15	Auditorium R7	HSE at NTNU and NV	Common
10:00	Auditorium R7	Fire protection, theory	Common
11:00	Outside Rfb	Fire protection, practical exercises	Common
11:45		Lunch break	
12:20	Auditorium R7	First aid, theory	Common
14:05	Hall, U1 Rfb	First aid, practical exercises	Group A
14:05	Auditorium R7	First aid, tasks	Group B
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14:40	Auditorium R7	First aid, tasks	Group B
15:30		End	

*Rfb:Realfagbygget

You must register for exam in HMS0003 and take a test in Blackboard to pass the course

Laws, regulations and guidelines



Regulations
(authority)

Examples

Regulatory authority
Responsible unit

Local routines
(Dean, head of Dep.)

General and laboratory specific guidelines/routines

Faculty
Department

NTNU guidelines
(Rector)

Chemicals and gases
Risk assessment

NTNU

Legal rules

Regulations
(Government)

Workplace regulation
Handling of hazardous substances

→ Labour Inspection Authority
→ DSB → Fire Department

Laws
(Parliament)

Working Environment Act
Fire/explosion protection Act

→ Arbeidstilsynet
→ DSB → Fire Department

HSE-info and guidelines at NTNU

All information at innsida.ntnu.no

- [HMS, HSE](#): Main website HSE
- [HSE](#) for students
- [HMS ved NV](#): (Norwegian) HSE-information and guidelines for NV-faculty

HSE FOR EMPLOYEES
Health, Safety and Environment

- [HSE guidelines summary](#)
- [HSE forms A-Z](#)
- [HSE courses](#)
- [HSE for students](#)

A good and safe working environment requires systematic and continuous HSE-work.

Laboratorie- og verksted
HANDBOK
www.ntnu.no

NTNU's Laboratory and workshop handbook is available in pdf or pocket size.

🇳🇴 🇸🇪

- ✔ **Chemicals index**
An index of hazardous chemicals, hazardous materials and injurious biological elements. Find datasheets, safety info, etc. [About safety datasheets](#)
[Log in to chemical index](#)
- ✔ **Risk assessment**
Evaluate unwanted incidents in the workplace, before they happen. Consider whether existing measures are sufficient. [About risk assesment](#)
[Log in to RiskManager](#)
- ✔ **Discrepancies**
Report injuries, dangerous situations or violations; or, tell us how to improve health, safety and environment issues. [About reporting](#)
[Report an incident](#)
- ✔ **Whistleblowing**
Report illegal or unethical activities, as well as situations that damage the NTNU organization or society in general.
[Whistleblower's guide](#)

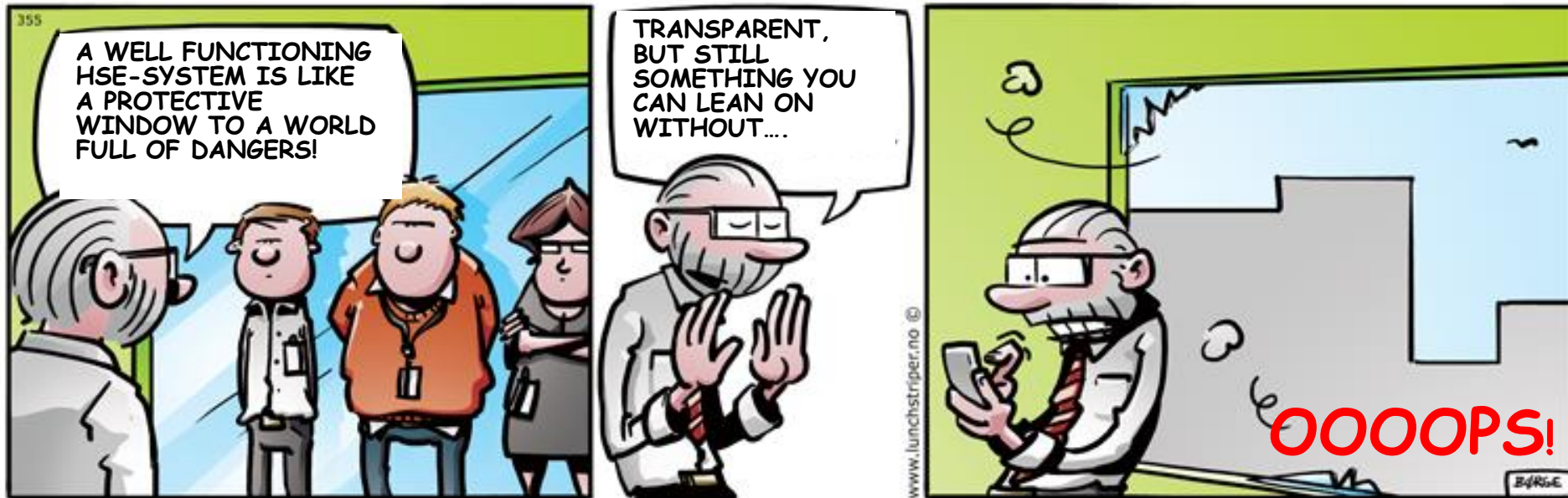
HSE topics

Office work
Fieldwork and travel
Laboratory and workshop
Fires and emergencies
Waste
Health
Plans and policies

Key contacts

- [Safety representatives](#)
- [HSE coordinators](#)
- [Radiation protection coordinators](#)
- [Chemical index contacts \(in Norwegian\)](#)
- [Occupational Health Services](#)
- [HSE Section](#)

HSE is taken care of by the «HSE-system» (?????)



The «system» can not fulfill our responsibilities!

It is what we actually do that counts!

HSE-responsibilities for students

- **Students** participating in teaching or performing lab work, field work etc. that may involve risks, have the **same rights and obligations as employees with regard to HSE** (The Working Environment Act).
- All employees and students have a **personal HSE responsibility**. This implies a **duty to cooperate**.
- HSE is the responsibility of managers at all levels.
 - ✓ The **Head of Department** has the overall responsibility of each department.
 - ✓ Anyone **who lead or supervise** the work of other employees or students, is responsible for ensuring that due care is taken to safety and health.

Personal Responsibility for HSE



Everyone has a **duty to cooperate** (WEA §2-3)

- ✓ Assess the risks in their own work
- ✓ Know and comply with the relevant guidelines
- ✓ Use required protective equipment
- ✓ Report dangerous conditions, accident, injury, etc.
- ✓ **Contribute actively to a good and safe working environment**



What are the success criteria for good HSE practices?

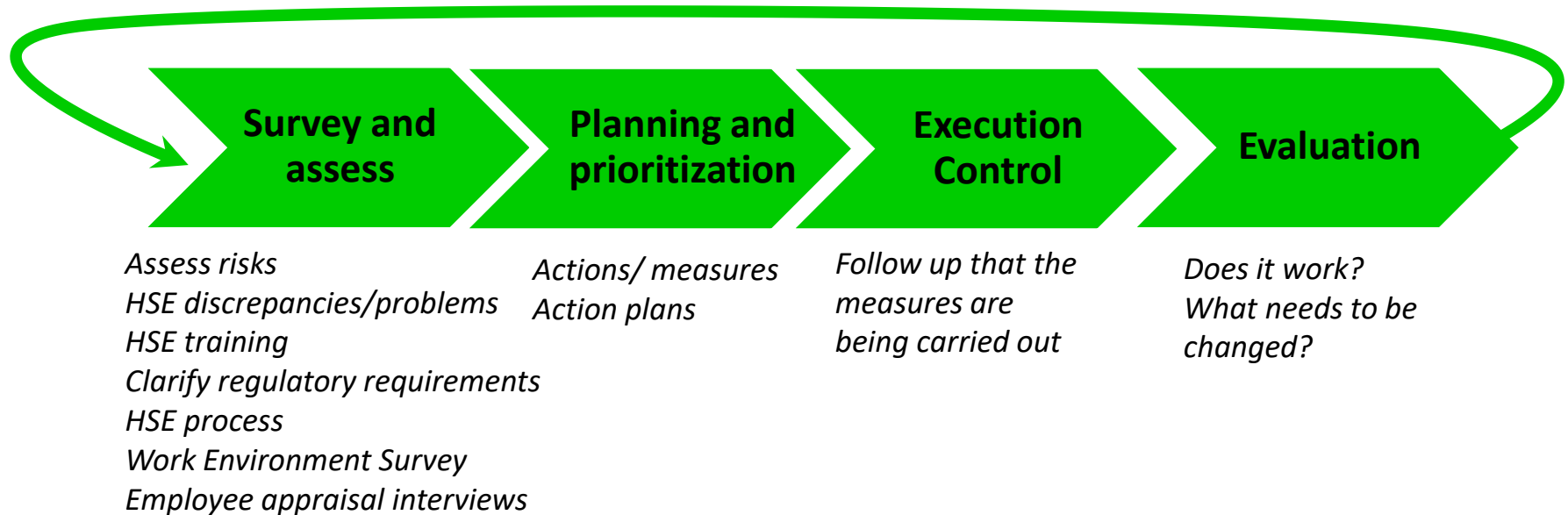
- Cooperation, participation, inclusion
- Information and training, motivation
- Share and learn from experience
- Good **HSE practice** is a result of the sum **actions** performed.
- The actions are carried out by **individuals** and controlled by their **attitudes**



HSE-culture

What is HSE work?

- Ensure a satisfactory work environment
- **Systematic work** aimed at continuous improvement



HSE work at NTNU should be carried out **continuously and systematically**,
- **At all levels, integrated in daily work**

HSE-problems and discrepancies:

WHAT is it?

- **Incidents causing harm to PEOPLE, environment, materials**
- **Dangerous conditions/situations or near accidents**
- **Violence and threats**
- **Violations of routines, procedures or legislation**
- **You can also report suggestions for improvement related to HSE**

WHY should we report HSE-problems?

LEARN from the incident

PREVENT new similar incidents

IMPROVE

Because it actually **WORKS!**

Duty to cooperate → report problems



HOW to report HSE-problems

Reporting problems

- Norwegian and English version and user guide
- Personal information shall not be reported in the system
- The report goes to the case handler (HSE-coordinator) at your unit
- Questions or problems: [HSE Coordinator at your unit](#) can help you
- You can always go into the system and follow your case

Kunnskap for en bedre verden

My profile | Inbox | **AA** | Help

Register

Overview

Actions

Reports

Select module



Health, safety and environment (HSE)

Report

Here you report incidents to safeguard people, the environment, equipment and property at NTNU; personal injury, harmful emissions to the environment, buildings or materials, threatening situations, violence or near miss and violations of routines, procedures, laws and statutory regulations. You can also suggest improvements regarding HSE at NTNU.

Hvordan melde / How to report ▲

HMS-avvik

Discrepancies

Helseforskningsavvik

Rutiner for behandler / ▲

Guidelines for Case Handler

HMS-avvik

Notification of unacceptable conditions: “Whistleblowing”



Whistleblowing is to report violations of:

- Laws and regulations
- Ethical standards
- Serious matters that might harm the University or society in general

You may notify your nearest leader, student representative or contact a student advisor at your program.

NTNU guidelines for [whistleblowing](#)

Advice and assistance:

[Student representative](#) (faculty/department)

[Studentombud](#)

Student representatives

- Safeguard students interests
- Student representatives at NV
 - ITVs are the students representatives in departments.
 - FTVs are students representatives at faculty level.

[Student representatives \(tillitsvalgte\) NV](#)

[Student democracy at NTNU](#) (in Norwegian)

Safety representatives for employees

- Safety representatives (Verneombud-VO)
 - Elected by **employees** at each department/unit.
- Local senior safety representatives (LHVO - faculty)
- Senior safety representative (HVO - NTNU)

Present in the [NTNU Working Environment Committee](#)
(AMU)

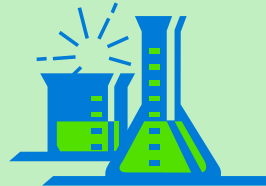
The working environment is made up of many factors

WORKING ENVIRONMENT

PHYSICAL ENVIRONMENT



PERSONS RELATIONSHIPS



Working Environment Act:
Should be "fully satisfactory" with respect to factors that may affect the employees' physical and mental health and welfare

Physical

- Air quality, light, noise,
- Chemicals, radiation
- Equipment
- Work Processes, ergonomics
- Safety barriers, protective equipment

Psychosocial Organizational

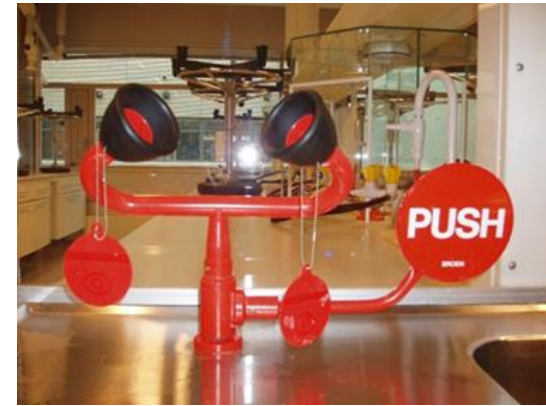
- Communication, collaboration,
- Affiliation
- Socializing and meeting points
- Culture/values

Training and information

- Confidence/safety
- Motivation and meaning

Physical work environment

- Adapted to type of work and person
- Satisfactory climate, light etc.
- Technical protective measures
- Personal protective equipment
- First-Aid equipment



Ergonomics

- Important to be aware of ergonomic factors to avoid work-related musculoskeletal problems
- This is important both in laboratory-, workshop and office work
- Listen to your body, take breaks, find good working positions
- Lots of Information about Ergonomics on Innsida:
 - [Ergonomics in the laboratory](#)
 - [Preventing muscoskeletal problems](#)
 - [Sedentary behavior and variation](#)

Psychosocial work environment



- The sum of organizational and social factors that affect the individual's health, well-being, creativity, and performance (in workplace/educational institution)
 - ✓ Balance between the demands and expectations placed on a person and the stimulation and learning opportunities on offer.
 - ✓ **Cohesion – communication - well-being** 😊
isolation – stress – conflicts 😞
 - ✓ The social interaction, **YOUR** contribution counts!
- The learning environment committee (LMU) at NTNU (with student representatives) monitors the learning environment and works to improve the environment.

Unacceptable behaviour- harassment and conflicts

- As a student at NTNU you should not experience discrimination, harassment or other improper conduct.
- If you would like to complain about unacceptable behavior from fellow students or employees at NTNU, the same guidelines apply for students as for employees. [NTNU guidelines](#)
- If you need advice in this context you should contact [SiT Health Service](#), [Studentombudet](#) or a student advisor responsible for your program.
- [Sexual harassment](#):
“unwanted sexual attention that is troublesome to the person receiving the attention.”

Special needs accomodation

<https://innsida.ntnu.no/tilrettelegging>

Students with special needs or disabilities can get help with individual accommodations.

- Specially equipped reading room places.
 - Personal mentor through NAV
 - Accommodations for exams (related to chronic illness, disability or injury)
-
- Contact NV-faculty: Sigurd H. Madsen: Realfagbygget E3-167, sigurd.madsen@ntnu.no

Health services

<https://www.sit.no/en/health>

<https://innsida.ntnu.no/helsetjenester>



- Health station, Campus nurse
- Doctors
- Psychologists
- Dentist; refunding
- Extraordinary health expenses; refunding
- Courses

Pregnancy and lab work



- The pregnant student is responsible **for informing her supervisor or lecturer** of her pregnancy.
- The lecturer/supervisor shall undertake a risk assessment and determine which **safety and security measures** that should be taken.
- The department has the responsibility to take the necessary actions.
- NTNU guidelines: [Pregnancy](#)
- See the NV-guidelines for pregnant women in lab for further description and info: [HMS ved NV](#)

Insurance

- NTNU recommend that you have a personal insurance policy.

Links to further information:

- [Forsikring for studenter](#) (in Norwegian)

Critical incidents/ emergencies: Emergency preparedness at NV and NTNU

- Emergency preparedness means **being prepared** when something happens
- **Everyone** can have a role in an emergency situation as the one detecting an incident and **must know the routines for notification**.

[Emergency preparedness at NTNU](#) (Norwegian and English)

[Emergency](#) (Norwegian and English)



Notification of



YOU discover the incident

Emergency?

Emergency numbers
110 Fire
112 Police
113 Ambulance

Notify nearest leader

First Aid?
Secure the scene?

No contact?

See back of keycard

Call for assistance

NTNU guard 918 97 373
Technical guard 918 97 335

NTNU emergency
800 80 388

Notification list NV

Save the relevant numbers for notification of emergencies on your phone!

Always prepared?



Things to consider....

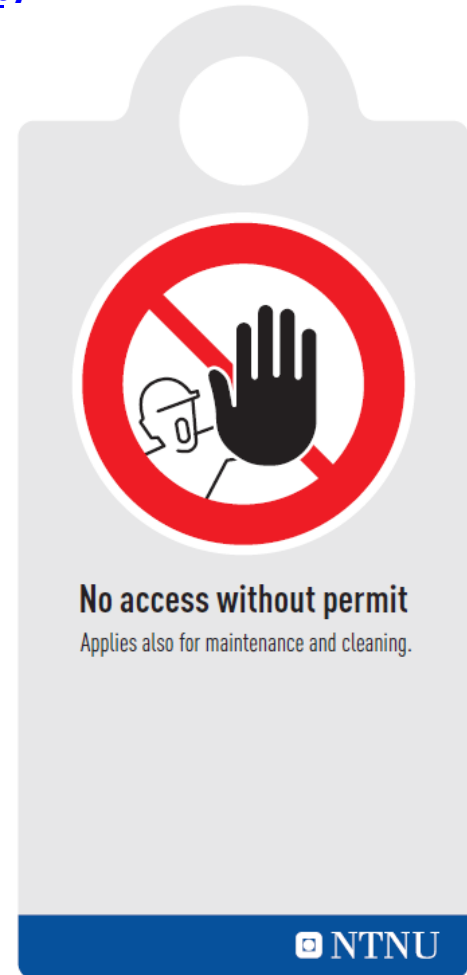
- *YES, accidents **MAY** happen also here.....* **RISK ACKNOWLEDGEMENT**
- *Can we **DO** what's needed if something happens?....* **CAPACITY TO ACT**
- *What can my **OWN ROLE** be in an emergency?.....* **AM I PREPARED?**

Categories of signs

Mandatory	
Prohibitory	
Danger/warning	
Fire fighting	
Evacuation	

Eye protection mandatory for everyone in eye protection lab.

See [Eye protection instruction for NV faculty](#)



Laboratory Coats

Material: cotton

Coat should be **whole and clean**

- Everyone should have two coats
- Coats to be marked with names
 - Family name and first name
- Delivered for washing at the faculty
 - Realfagbygget DU4-103. Akrinn TU1.303
 - See [routine for lab coats](#)



FAMILY NAME, FIRST NAME

Substance index

Safety data sheets

Helsefare:



Akutt giftig



Kronisk helsefare



Annen helsefare



Etsende

- All chemicals, dangerous substances and gases **shall be registered and risk assessment performed** in the substance index (EcoOnline) before use.
- **Safety data sheets** for chemicals/substances are obtained from the substance index. Everyone working with chemicals have access. **Read the data sheet before you start using the chemical!**

- [NTNU substance index](#)
- [Substance index representatives](#)



Tablet for digital access

Safety Data Sheets	
Contents	<ol style="list-style-type: none">1. Identification of the substance/ preparation and the company/firm2. Hazard identification3. Composition/Information regarding constituents4. First aid measures5. Fire extinguishing measures6. Measures in the event of unintended discharge/emissions7. Handling and storage8. Exposure control/protection of personnel9. Physical and chemical properties10. Stability and reactivity11. Toxicological information12. Ecological information13. Disposal14. Information regarding transportation15. Regulatory information16. Other information

Room card

- Responsible unit
(*hovedvirksomhet*)
- Responsible for room
(*romansvarlig*)
- Manager (*linjeleder*)
- Emergency/Guard
- Type of activity and risks
- Gas and flammable liquids
- Verification date

Room cards

Romkort



HOVEDVIRKSOMHET

Institutt for kjemisk
prosessteknologi (Fakultet for
naturvitenskap)

ROMANSVARLIG

EDD ANDERS BLEKKAN

☎ 73594157

☎ 91682708

✉ edd.a.blekkan@ntnu.no

STEDFORTREDER

KARIN WIGGEN DRAGSTEN

☎ 91897245

☎ 91897245

✉ karin.w.dragsten@ntnu.no

LINJELEDER, HOVEDVIRKSOMHET

JENS PETTER ANDREASSEN

☎ 73594209

☎ 92032209

✉ jens-
petter.andreassen@ntnu.no

ANNEN KONTAKT

☎ Beredskap:
NTNU: 800 80 388

☎ Vekter:
NTNU: 918 97 373 (etter arbeidstid)

Bygg nr. 316

Rom nr. 222

Kjemihall D, 2.etg

Kjemihallen, 7034 TRONDHEIM

Aktivitet: Forskning

Særlige farer: Brennbare og giftige gasser inkl. CO og Nox

Andre opplysninger: Gassdeteksjon fra Honeywell, automatisk avstegning av brennbare gasser og oksygen ved høy alarm i rommet og utløsning av brannalarm.



BRANNFARLIG GASS UNDER TRYKK

Totalt volum: 790 liter

Antall flasker: 19



GIFTIG GASS UNDER TRYKK

Totalt volum: 310 liter

Antall flasker: 11



ANNEN GASS UNDER TRYKK

Totalt volum: 1270 liter

Antall flasker: 27



GASS FRA SENTRALGASSANLEGG

Gasskilde / gasslager:

K5 - M052 og M053

Type gass:

Hydrogen, Argon, Karbondioksid, Nitrogen,
Luft og oksygen, Helium

Utskrift 2018-08-15 11:14 Espen Fjærvik

OPPLYSNINGER
VERIFISERT

DATO/SIGN.

DATO/SIGN.

DATO/SIGN.

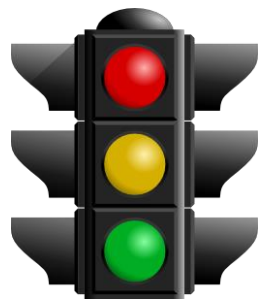
Risk assessment

- systematic handling of risks

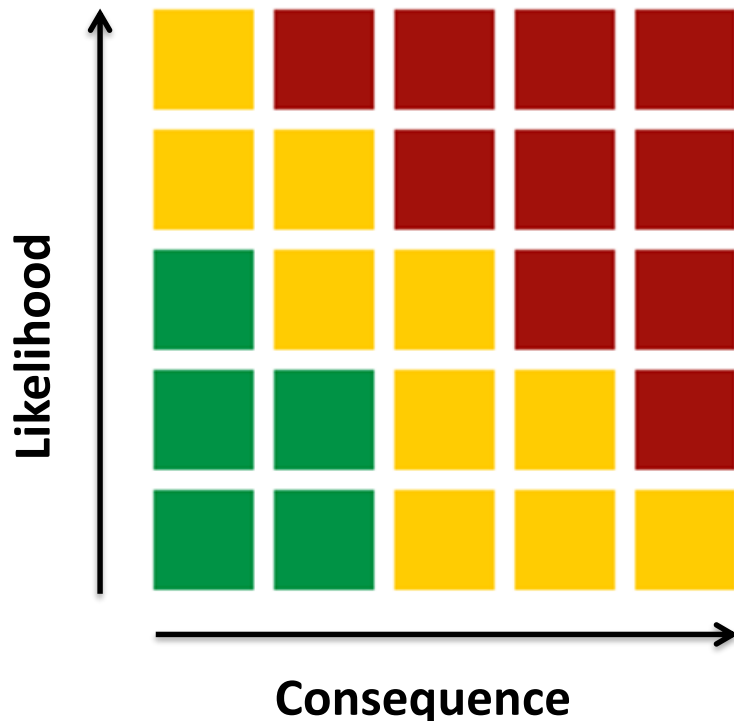
- What should be assessed? (*danger source, object*)
- What can go wrong? (*unwanted incidents*)
- Why can it go wrong? (*causes*)
- What is the *likelihood*?
- What could be the *consequences*?
- What's so far been done? (*existing measures*)
- Is the risk acceptable? (*acceptance criteria*)
- What more can we do? (*new measures/safety barriers*)

Evaluation and quantification

Risk acceptance criteria



Consequence \times Likelihood = Risk value



The colors indicate the degrees of risk:

- **Red:** Unacceptable risk. Measures must be implemented.
- **Yellow:** Assessment area. Measures to be considered.
- **Green:** Acceptable risk. Measures can be considered.

Risk assessment process



- To be carried out for all activity involving risks, before start and before significant changes in an existing activity
- Obtain knowledge of activity (on-site inspection/demonstration)
- Gather all relevant information (data sheets, manuals, etc...)
- “Brainstorming” - what can go wrong and why?
- Describe the risks of all relevant adverse incidents
- Determine and implement measures to reduce the risks
- Consider the end result - are the risks acceptable?



Innsida: <https://innsida.ntnu.no/wiki/-/wiki/English/Risk+assessments>

Risk assessment of master thesis



- Prior to master thesis work a risk assessment shall be carried out. This assessment shall be included as an attachment to the master agreement.
- The assessment shall be done **in cooperation with your supervisor**. Also, the HSE-coordinator and others at the departments can give advices.
- Risk assessment should help to ensure that due care is taken to the safety issues in the master project.
- Guidance for performing risk assessment of the master project:

[HMS ved NV](#)

NTNU	Guidance for risk assessment of master theses	NV-faculty	Guidance	
		Page	1 of 2	
HMS		Date	2016-11-15	
		Replaces	2014-06-23	

Objectives and responsibilities

The supervisor has to assess the feasibility of the project with regard to safety before the master projects are offered to the students. Before the master project starts, risk assessment shall be carried out in **cooperation between supervisor and student**. It is the supervisor's responsibility that the risk assessment is performed. The assessment will be included as an attachment to the master agreement.

It is the **supervisor's liability** that proper concern for health and safety is taken and the **student has an independent responsibility** to contribute to this (see Norwegian Working Environment Act §2-3).

<http://www.lovdatab.no/all/tl-20050617-062-002.html#2-3>

If co-supervisors are involved in the training and supervision of the student's laboratory work, the responsible supervisor must clarify the HSE responsibilities involved and the co-supervisor(s) shall if necessary participate in the risk assessment.

Risk assessment prior to start of the master projects should clarify the responsibility that lies with both the student and supervisor (s) in order to protect health, safety and the environment. The **HSE Coordinator** can help with general training, information and advice for carrying out the risk assessment.

The risk assessment submitted together with the master agreement, forms a basis for further risk assessment during the master project. The need to update the risk assessment depends on what new items or changes are brought into the project. If changes are made so the risk assessment no longer covers the relevant risk factors and safeguards, an update must be carried out. Student and supervisor are jointly responsible for assessing the need for performing a new risk assessment.

Who to ask about HSE-issues?

- Academic supervisor
- Engineer associated with laboratory or team
- Person responsible for instrument / device (“Instrumentansvarlig”)
- Person responsible for laboratory (“Romansvarlig”)
- HSE-coordinator
- Representatives for substance index, radiation, waste....
- Student representative

HSE-roles at the NV-faculty:

Persons at the NV faculty who have been assigned specific HSE-responsibilities and tasks you will find here: [HMS-roller ved NV](#)



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