

<i>Rubrik</i> HSE requirements within hydro		
<i>Gäller fr o m</i> 2019-03-13	<i>Dokument id</i> S3700	<i>Utgåva nr</i> 3
<i>Utfördare</i> Marie Jacobsson	<i>Godkänd</i> Sara Jönsson	<i>Sida nr (av)</i> 1 (16)

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1 Purpose

Work and visits at Sydkraft Hydropower ABs (SHP) facilities should not cause harm to people, environment or facility.

2 Responsibility, roles and obligations

2.1 Guidelines against offensive treatment

No one should be subjected to offensive treatment at our workplaces.

Sydkraft Hydropower AB has overall responsibility for the work environment at our workplaces, which implies an obligation to take measures to prevent any employee or contractor who works for us from being subjected to offensive treatment.

It is our common responsibility to prevent offensive treatment by thinking of word selection and behavior, counteracting unacceptable behavior by others and supporting the person being exposed.

It is our joint responsibility to act if we discover actions that are not consistent with what we expect from SHP from our employees and contractors.

2.2 Employer/Contractor

It is each employer's responsible to fulfill the requirements of the systematic work environment regulation (SAM) and they should be able to present this upon request. The employer is obliged to provide the correct personal safety equipment and make sure that each employee has the necessary competence. The employer is also responsible for carrying out adequate safety measures, work planning and inspections of facilities, machines and equipment. It is also the employer's responsibility to make sure that all equipment is approved and inspected.

It is the responsibility of foreign contractors to follow the regulation *SFS 1999:678 Posting of Workers Act*. The contractor is responsible in making sure that their own personnel and sub-contractors are following the regulations and requirements of this routine.

2.2.1 Hired personnel

Work environment responsibility for hired personnel lies on the company hiring personnel to perform work.

2.3 Safety coordinator

SHP has as owner of the facility, the responsibility for the work environment and the coordination of work duties according to *AFS 1999:3 Building and civil engineering work*. Coordinating responsibility in Hydropower South facilities is procured within operating and maintenance agreements. Coordinating responsibility in projects could be procured by other company and is written in the work environment plan. The safety coordinator has following work duties:

- Coordinate and control work within the operation fence or inside the hydropower facility
- Inform about SHP rules, routines, special circumstances and risks on the work place

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- On the plant owners behalf, control that workers have sufficient competence
- Make sure that no unauthorized people is inside the SHP facility
- Make sure that information about appointed safety coordinator is visible on the facility
- During projects, not building and civil engineering work, be responsible for, establish and update the environmental and work environmental plan
- During building and civil engineering work, make sure the coordination occur with the building work environment coordinator (BAS-U)

2.4 Building work environment coordinator – BAS-P / BAS-U

If building and civil engineering work shall be conducted on the facility, SHP appoints a building work environment coordinator for planning and projection (BAS-P) and for performance (BAS-U). External BAS-P and BAS-U assignments shall be written.

3 Work at the facility, work hours and keys

Operation center and safety coordinator or BAS-U shall be notified when work starts and finishes at the facility. To be allowed to work alone on a facility shall each person:

- Receive a local safety introduction on site by a representative with good knowledge about the facility
- Pass the trainings SSG Entré Basic training course (grundkurs) and SSG Entré Sydkraft Hydropower
- Pass adequate ESA training with regard to work duties and facility

Persons that do not fulfill these requirements shall be accompanied during their presence at the facility.

3.1 Work hours

During projects, the project manager creates a routine together with the operation center for continuous contact. The project manager decides rules for work hours within the project, and this is to be presented in the work environment plan.

3.2 Solitary work

During planning of solitary work shall a risk assessment be performed by the employer to guarantee possibility for contact and to minimize the increased risk that occurs during solitary work. For more information, see *AFS 1982:3 Solitary work*.

3.3 Keys and ID card

Safety coordinator in Hydropower North is providing keys. Plant managers and project managers in Hydropower South is responsible for ordering keys or tag. Keys and tags shall be personal receipted and connected to access demands. The administration is handled by the reception in Sundsvall.

Every person at the facility should be able to show a valid ID card.

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4 Trainings, certificate and languages requirements

All main contractors must have completed and submitted the template "List of staff at site" no later than two months before physical project start. People who are not on the list will be treated as visitors with subsequent restrictions.

4.1 Local safety introduction

Personnel that are working and visiting a facility for the first time shall receive a local safety introduction at the site. The person who takes the personnel to the facility shall make sure that the local safety introduction is being performed. The introduction shall be given by a person with good knowledge about the site and it shall include following parts:

- Identified risks, sensitive areas and measures
- Environment and work environment plans
- Routines for emergency, evacuation and assembly point
- Equipment for personal protection, fire and first aid
- Information boards at the entrances with safety rules
- Organization and responsibility – Safety coordinator, safety representatives, BAS-U and operation center
- Access and permits
- Take part of, for the work relevant, facility specific instructions connected to HSE.

The contractor shall be trained in evacuation if procurer, BAS-U or safety coordinator decides. Training could be performed with the local fire brigade.

4.2 SSG

SSG Entré Basic training course (grundkurs) and SSG Entré Sydkraft Hydropower shall be performed individually with approved result before work starts. Each person shall be able to display their SSG card at the site, the training is valid for three years. Each contractor manages SSG for their own personnel.

4.3 ESA – Energy industry safety directions

SHP applies safety directions developed thru Energy companies (Energiföretagen) Sweden:

- ESA 14 (Ground and Work) – electric work and work in electric facility
- ESA Waterways – work on or near moving parts, work on shutdown moving parts and work at or near waterways.

4.4 Certificate

Valid certificate for work which is needed shall be displayed upon request.

4.5 Language requirements

The person that hire labor force that do not speak the Swedish language shall make sure that the personnel handles following levels of English according to CEFR = Common European Framework of Reference for Languages:

- Work management and their replacement: English according to level B2

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- Other workers: English according to level A2
- Work management and its replacements: must be able to communicate with everyone at the lowest level B2 in any language.

5 Risk management

Employer shall regularly examine and risk assess the work environment and inform the workers at the site about identified risks. Employer shall also make sure that the workers have sufficient knowledge about safety measures to prevent risks. A risk analysis shall be performed before each work. A last minute risk assessment shall be performed in connection to the start of work.

5.1 Safety inspection

A safety inspection is performed to examine the environmental and work environmental conditions, it is also performed to identify eventual risks. Periodicity is determined by safety coordinator or BAS-U and concerned contractor is obliged to participate. The safety inspection shall begin with a review of previous protocol and measures that cannot be executed immediately shall be put into an action plan.

5.1.1 Safety inspections in projects

Protocol from safety inspections in project shall be visible on the site and sent to SHP project manager and HSE responsible via shp.hsse@uniper.energy.

5.1.2 Annual safety inspections

At least once a year should a safety inspection be performed in each facility. Responsible for annual safety inspections is maintenance supervisor in Hydropower North and O&M Contractor in Hydropower South.

5.2 Risk assessment

Written risk assessments and belonging action plan shall be performed for work duties with high risk. Example on high risk work duties is:

- Heavy lifts
- Work in confined space
- Work with personal fall protection
- Work in connection to large natural values, is written in the local environmental instruction

Plan for rescue operation shall be established before start of work when risk assessments have shown it to be necessary.

6 Chemical products and risks

Use of chemicals within SHP should be minimized and harmful products should be replaced by less harmful products that fulfill the quality requirements. According to *AFS 2014:43 Chemical Hazards in the Working Environment* the employer has a responsibility to perform risk

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assessment for work with high risk chemicals. According to the *Swedish environmental code*, precautionary principle product with unknown characteristics shall be handled as a hazardous product. Maintenance personnel and O&M Contractors are responsible for at least once a year check if the list of chemicals in the chemical management system is aligned with the products at the facility, and remove products that are no longer used.

During larger projects when chemical substances above 1 ton is being imported, also applicable for production, shall the importer make sure that these products are registered to the European chemical authority (Echa) at latest 31st of May 2018.

During chemical work, make sure that absorbents are available to handle an eventual spillage.

6.1 Safety data sheet

The person who is going to use a chemical product at a SHP facility shall before usage send a safety data sheet in Swedish to HSE responsible via shp.hsse@uniper.energy. Information about which alternative products that have been taken into account during the choice and expected amount that will be used should also be provided. HSE responsible approves products and updates the list of chemicals in the chemical management system where the risk assessments are being put in. Safety data sheets or protection sheets should be available, where the product is stored, in Swedish and in the language the user understand. HSE responsible should be notified when a product no longer is being used and could be removed from the facility.

6.2 Storage and labeling

Chemical products should be stored at designated area with clear signs and notifications about eventual hazards and be equipped with leakage protection. Chemical products in projects should be stored separately from products that are used in normal operation.

Storage vessels and facility parts should be labeled according to *AFS 2014:43 Chemical Hazards in the Working Environment* and *CLP regulation (EG) nr 1272/2008* on Swedish regarding the content and be properly sealed. Project contractors label their products with company name and are responsible for that each product is not installed in the facility will be removed from the facility after ended project. HSE responsible should be notified about this. Vessels with unknown content are being handled as hazardous waste.

6.3 Pesticides

Usage of pesticides e.g. weeds or rat poison should be avoided. According to *Regulation about pesticides SFS 2014:425* a permit is required from county administrative board, with training requirements, during usage of herbicides class 1 and class 2. Information about classification is written in the safety data sheet. A permit or notice is also required to the municipal committee. During usage of class 1 biocide product against pests a usage permit from public health authority is required.

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6.4 SF6 and refrigerants

Facility owner and maintenance personnel in facility where the isolation gas SF₆ is present (in switches and refrigerants in heat pumps, cooling and air-condition equipment) should be instructed how the equipment should be handled. According to *EG/517/2014 Regulation about flourishing greenhouse gases* a periodic leakage test is required for refrigerants 5 ton CO₂ equivalents, leakage control for equipment containing more than 6 kg SF₆ and leakage warning systems for equipment containing more than 21 kg SF₆.

6.5 Oil

Water that is being released to the surrounding environment should not contain more than 5 mg/l oil. Stricter requirements could be established within each municipal. Equipment, containing oil, no longer in use should be emptied and the oil should be reused if possible and handled as hazardous waste. If PCB contaminated oil is suspected, oil sample be sent for analysis and facility manager / HSE coordinator is to be contacted.

Hydraulic oils used in construction machinery must be included on RISE's list of products that meet the environmental requirements in Swedish standard 15 54 34, Hydraulic fluids - Requirements and test methods.

7 Waste

According to the Swedish environmental code, the waste hierarchy shall apply to minimize the amount of waste. At firsthand the waste should be reused, than material recycled, followed by energy recycled and last disposed.

According to *Waste regulation (2011:927)* should all waste be sorted at appointed place, be protected from collision, weather and wind, be measured and documented before transportation to approved waste receiver. Each contractor is responsible for sorting, documenting and removal of own waste. The amount and type of waste is included in the annual environmental report to HSE responsible according to specific template.

Local incineration of waste is not allowed. Exceptions could be made for clean plant waste if approved by plant and the municipal. Read local environmental instruction.

7.1 Hazardous waste

According to Swedish legislation, transportation of hazardous waste requires permit if the amount of waste is above 100 kg or liter/year or if the waste contains mercury (whole fluorescent lamps is excluded), cyanide, cadmium or PCB. Transportation below permit levels requires a notification to the county administrative board every fifth year. Transportation document must be established and archived for three years. Hazardous waste marked with * in appendix 4 in

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2011:927 Swedish waste regulation. Examples on hazardous waste are asbestos, oil, fluorescent lamps, impregnated wood, electrical equipment, glycol etc.

Environmental shed at the facility is intended for chemicals and hazardous waste during normal operation. Chemical waste should be clearly separated from chemicals used in the normal operation.

8 Hot work

Each company, performing hot work, shall have a permit manager approved by SHP. Template *Assignment as Permit Manager during flammable Hot Works* should be filled and permit manager is responsible of that *Safety rules for Hot Work* will be followed. Both the permit manager and the hot worker shall have training with certificate provided by the Swedish Fire Protection Association or its equivalent in Finland, Norway or Denmark.

9 Confined conductive spaces

A confined conductive space is limited mainly by electrical conductive limitation areas. During work within the space it is possible that a person could get in touch with electrically conductive parts with a considerable part of their body and were the possibility of disrupt the contact is limited. Examples on confined conductive spaces are penstock, pressurized oil systems, turbine spiral, floodgates and draft tube.

Equipment that is used must be powered by battery, fed by low voltage protection (SELV) or fed via a protective or isolation transformer. The feeding shall be placed outside the confined conductive space.

Every 230 V AC protective separated socket shall have their own transformer windings and is only to be used for one handhold electric tool or portable measure equipment. Cables shall be visible and protected against external impact, maximum switch-off time at 2 pole errors is 0,4 seconds.

At maximum 60 VDC or 25 VAC low voltage protection (SELV) it is allowed to use multiple handlights per outage. Cables shall be protected against external harm.

10 Equipment, machines, tools and protective device

10.1 Protective device

Person that is supposed to use a machine or equipment shall make sure that protective devices works properly before start of work. A protective device is only allowed to be removed after a risk assessment and permission from safety coordinator or BAS-U. If a work is causing a risk for injury, a temporarily protective device must be installed e.g. guardrail, screen or sign around the

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work area. Temporarily protective devices could only be removed by the person installing the temporarily protective device. All openings shall be covered and able to carry any possible load, be mounted firmly and marked.

10.2 Personal safety Equipment

The employer is responsible for providing personal safety equipment in good condition with instructions about accurate usage. Adapted demands shall be formed and written in the work environmental plan.

Safety helmet and safety shoes must always be used at the facilities, this also applies for visitors. Visibility clothing shall be used during lifts and at areas where vehicle traffic is present. Visitors should always wear a warning vest / warning clothing. Arc-tested clothing is required for work on electrical connections and electrical work. Clothing in this context refers to clothing that you have "on the outside", underwear, shoes, gloves, helmet and visor.

Other protective equipment must be used where the risk analysis requires. Examples of such equipment are escape mask, life jacket, gloves, respiratory protection, hearing protection, safety glasses, fall protection and flashlight. The user is responsible for ensuring that the personal protective equipment is maintained in good condition. See also *AFS 2001: 3 Use of personal protective equipment*.

10.3 Hand tools and hand machines

Contractor provides own hand tools and hand machines. Angle grinders shall be equipped with; extra handle, re-start protection, adjustable disc protection, brake, anti kick-back device and dead man's grip. Safety glasses, visor, gloves and protective clothing of the arms is required during usage of angle grinder.

10.4 Inspection required equipment

Each employer is responsible for maintenance, inspection, supervision and daily control of own technical equipment. Certificate from annual inspection shall be shown for safety coordinator before work starts.

10.5 Scaffolding

During work on scaffolding higher than 1 meter shall the scaffold be equipped with minimum 1 meter high two parted guardrail and a 0,1 meter high toe board. If this not is possible shall personal fall protection equipment be used. Holes and openings must be screened and warning signs located nearby.

Scaffold contractor shall be authorized at the professional contractors' trade association (STIB) or equal. The contractor is responsible for making sure that risk assessment is performed before

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building of scaffolding starts. Within the risk assessment shall the need of barrier around and under the scaffold during building and usage be included. See also *AFS 2013:4 Scaffolding*.

10.6 Ladders and trestles

A ladder is only allowed to be used as access route and for short term work from the ladder if the work could be performed with one hand e.g. cleaning, change of light bulb, simple lubrication etc. The ladder must be shorter than 5 meters.

All loose ladders and trestles must be type tested and marked with:

- Name of manufacturer or importer
- Manufacturing year
- Type designation and
- Applicable standard or name of certification organ and type designations number
- If necessary, they shall also be marked with assembly instructions

10.7 Lifts with lifting devices or lifting tools

Lifting must be valued before they start so that it can be carried out safely under the prevailing conditions. For all lifts:

- The driver of the lifting device is responsible
- Lifting device must be inspected
- Lifting must follow the safest route
- Lifting should be carried out as low as possible
- Safety distance to be determined
- Lifting equipment must be checked, approved and clearly marked with maximum permissible load
- Lifting must not be carried out over people

A lifting plan must be established if work needs to be carried out with persons underneath hanging objects or if the lift can result in serious damage to the plant. Filled lifting plan must be notified to Uniper.

When lifting where work needs to be carried out with persons under suspended load, the load must be mechanically limited so that the risk of personal injury is counteracted.

If the lift can result in serious damage to the installation, the system to be lifted should be taken out of service. Identified risks due to lost load must be eliminated or limited.

In connection with the start of the lift, a last minute risk analysis shall be carried out.

Personal fall protection equipment is mandatory when using a mobile work platform and all persons in the lift must be anchored in defined anchorage point.

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10.7.1 Driver of lifting device

Lifting device drivers shall hold:

- Valid certificate
- Employer's certificate
- Plant owner's permission (Coordinator or alternatively BAS-U)

11 Fire safety

11.1 Fire equipment and fire alarm

Facilities shall be provided with mobile and maintained extinguishing devices. It is a common responsibility to minimize the amount of combustible material at the facility. During a fire alarm work shall be ended quickly, valves on gas tubes shall be closed and personnel on the site should assemble on designated assemble point. Elevator is not allowed to be used during evacuation. Doors exiting operation rooms shall be equipped with vertical emergency openers.

11.2 Gas tubes

Gas tubes shall be stored at designated storage area, be well sealed and have their protective bonnet on. Acetylene tubes must be equipped with flashback arrestor and the welding handle shall be provided with return valve on both the acetylene and oxygen side. A sign shall be placed on the outer door to inform that gas tubes are located inside the building.

12 Environmental and work environmental plan

In each project, carried out by SHP, an environmental and work environmental plan shall be established with the purpose of working safely and minimize the environmental impact from the work. *AFS 1999:3 Building and civil engineering work*, with support in AMP-guide, sets the requirements on work environmental plan. SHP has decided that work environmental plan has to be established also for projects carried out as process refurbishments. An environmental plan shall make sure that requirements in the *Swedish Environmental code* are being fulfilled. SHP provides a template for environmental and work environmental plans. If the contractor chooses their own template it shall minimum include following parts:

1. **Organization** with designated responsibility for environment and work environment
2. **Rules and demands** that is applies on the work site
3. How **accidents, near misses and deviations** is being handled, documented and reported to SHP
4. **Emergency routine** with list of contact persons
5. **Waste management**, sorting, storage and transport
6. How **energy and use of resources, including transports**, is being minimized
7. **Chemical list**, safety data sheet, handling, storage and description about how least hazardous product has been chosen
8. **Other operation** that could impact or be impacted by the work on work site

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9. **Risk for health and environment** with preventive and protective measures, at least following list shall be considered:
- Fall - work done at height over 2 meters
 - Excavation work with a risk of landslide
 - Work with hazardous chemical and biological substances (eg asbestos, dust, thermosetting plastic)
 - Work with ionizing radiation
 - Work at high voltage lines
 - Work with drowning risk
 - Underground work - tunnels, wells, pipes
 - Work with diving equipment
 - Work in checkout
 - Blasting and working with explosives
 - Work with heavy building elements and molding elements
 - Work along roads and railways
 - Demolition of load-bearing structures and hazardous materials
 - Work that can cause the release of oil or other chemicals into the environment
 - Work requiring a lowering of the water surface and drying
 - Work that can cause clouding
 - Excavation work in sensitive soil, in water protection area, wetland, or other protected area
 - Finding pollution in soil or water
 - Work that generates waste or hazardous waste
 - Consumption of materials
 - Transportation
 - Power consumption
 - Other

During building and civil engineering BAS-P is responsible for establishing the work environment plan basis during the planning and projection stage. During the execution stage BAS-U is responsible for updating and adapting the plan. For other work than building and civil engineering, safety coordinator is responsible for establishing and updating the plan.

All contractors shall hand in basic information for the environmental and work environmental plan in good time, minimum four weeks before work begins. This to make sure that safety coordinator has appropriate time to compile all the information before the project starts. The compiled environmental and work environmental plan shall be reviewed during start of project.

The environmental and work environmental plan shall be specific written for the site and reviewed continuously during changed of work methods, outer conditions and risks. The plan

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shall be available for all personnel on site. There shall only be one work environment plan in a project. However, each contractor can have their own environmental plan.

12.1 Workplace disposition plan / allocation table (WPD-plan)

During project and when necessary shall a workplace disposition plan, WPD-plan, be established and be posted.

13 Incidents, risk observations and risky behavior

13.1 Incident

An incident is either an accident or a near miss. An accident is an event that has caused harm on people, environment or assets. A near miss is an event that could have caused harm to people, environment or asset if the conditions were different.

Accidents and near misses shall as soon as possible be reported to the operation center via +46 60-12 77 77 for facilities in Hydropower North and via +46 60-12 93 95 for facilities in Hydropower South. Alternatively via safety coordinator or BAS-U who then notifies the operation center. Information about the event, causes, damages and performed measures shall be included in the report to the operation center. Remember that:

- Further risk of damage on people, environment or asset shall in most reasonable extent try to be stopped.
- During release of chemicals, report collected amount of chemicals and other materials to SHP. This shall also be included in the annual environmental report.

13.2 Risk observations and suggestions for improvements

Person that observes a condition that may lead to danger for people, environment, asset or operation shall immediately correct the condition via accurate measure. If this is not possible shall work be stopped and employer and safety representative be contacted. Risk observations that have been discovered shall be documented and followed up.

As help for documenting "Safety Awareness Card" is available at the facilities, when completed this shall be sent to facility owner/maintenance supervisor/project manager and HSE responsible via shp.hsse@uniper.energy. Other observations as for example comments from the public should be reported to the operation center and be registered in Lotsen.

13.3 Incident investigations

The employer has a responsibility to investigate accidents, near misses and bad conditions. Contractors that are located on SHP facilities is forced to cooperate and attend in investigations, this to prevent accidents and unhealth on the work site.

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14 Temporary establishments

Placement of barracks, sheds and coupling of water, drain and building power shall be performed according to SHP instruction. Construction centrals 220/380 V shall be provided with residual current device and each cable shall be protected against mechanical impact.

15 Alcohol and drugs

The work place shall be free from alcohol and drugs, random test could be performed. Usage before or after work that could affect work hours should be refrained. Persons affected by alcohol or drugs will be immediately terminated from the work area. Smoking is only allowed outside in designated areas and cigarette butts should be thrown in designated waste container.

16 Housekeeping

Material and waste shall be stored in a designated location. Waste shall be disposed continually during the work day. Obstacles and other risks for slips and trips must be removed especially in access routes, stairs, scaffolding and work platforms. Transportation and escape routes are not allowed to be blocked. Contractors are responsible for their work area and personnel area with daily cleaning.

Access routes and parking lots must be cleared of snow and spread with sand to minimize the risk of slips. The responsibility is regulated by contract.

17 Traffic rules

When risk assessment demands shall a traffic order plan be established that shows temporarily traffic solutions. The traffic order plan shall be visible and available for all personnel at the site. Within the work area vehicle parking is only allowed on designated areas. General speed limit within the facility is 30 km/h. Work vehicles shall during reversing use sound and light signal. Transportation routes must not be blocked.

During parking of vehicles in underground facilities the vehicle shall be faced towards the exit, wind shield left open and the key be put on the driver seat. The emergency button on the alcohol lock could be used during an eventual evacuation.

18 Noise

Noise shall be reduced as close as possible to the source and be screened thru planning and choice of methods, machines and equipment. Sound systems (radio, earmuffs with radio or equal) are only allowed to be used after permission from employer and BAS-U or coordinating responsible.

If the average noise level during an 8 hours work day is 80 dB(A) or more, the employer shall inform and train the employees about the risks with noise and provide hearing protection. If the average noise level during a 8 hours work day is 85 dB(A) or more, the employer must perform measures, make sure that hearing protection is used, offer hearing test and put up signs.

<i>Rubrik</i> HSE requirements within hydro		
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19 Dusty work

Dusty work shall be reduce as close as possible to the source and screened of thru planning of methods, machines and equipment e.g. watering, integrated air extract on the machine/tool, point air extract and dust collection on conveyor belt . Impact drill must be equipped with vacuum cleaner to avoid drilling dust to appear.

20 Work in soil and water

Work in soil and water shall be executed with consideration of valuable natural types and species, this by choosing environmental adapted fuels and time of work. Arrangement of machines, diesel and oil tanks should be on hardened surface and sufficient distance from water. To gather knowledge about the natural values of actual locations, read the local environmental instruction.

21 Energy usage

The most efficient vehicles, machines, material and methods shall be chosen to minimize the energy consumption.

22 Environmental data reporting

After ended project or 20 January, the latest, shall environmental data from the previous calendar year be reported to HSE responsible via shp.hsse@uniper.energy. Templates for reporting of environmental data are available for normal operation and project.