

Outokumpu Tornio plant Safety and Environmental training

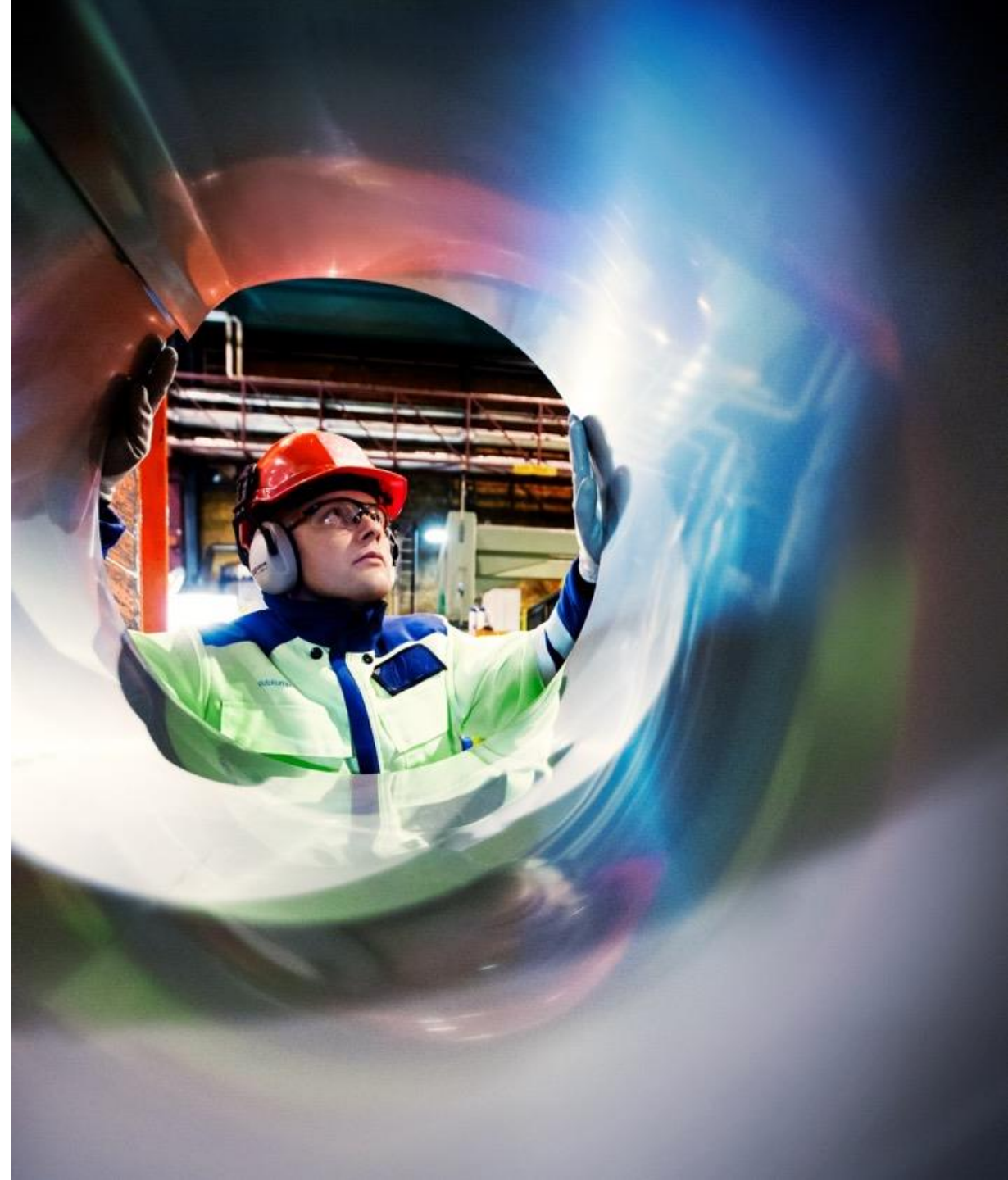
2021



Learning objectives

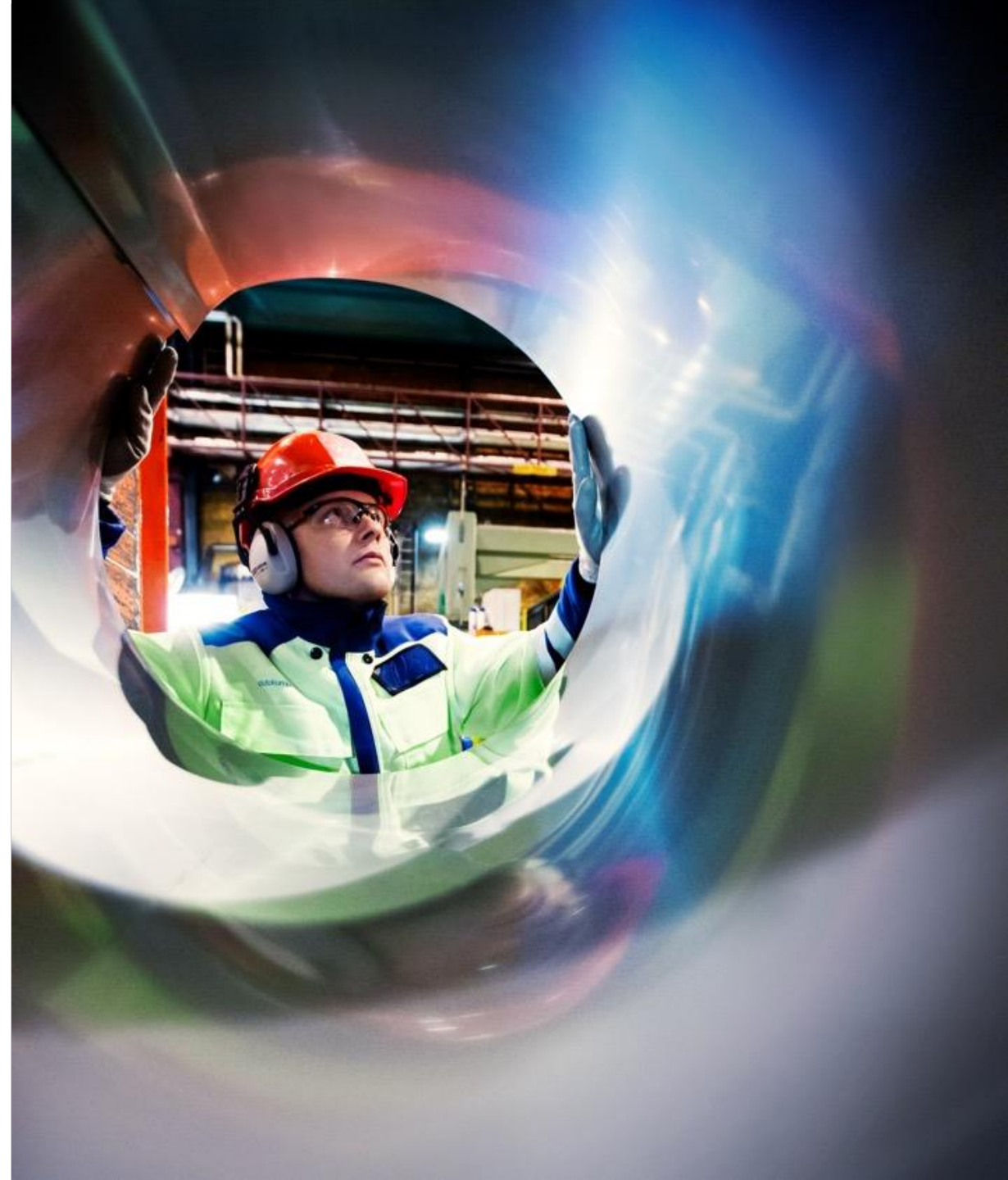
During this course, you will learn

- What work safety in Tornio plant area means
- What are the specific hazards of the area
- How you can contribute to the creation of safe working environments and working methods



About the training

- You must pass this training and exam to get an access pass to the Tornio plant area
- Training is mandatory for contractor employees and Outokumpu employees
- Training is valid for 12 months
- Outokumpu introduction films (Youtube):
 - [This is Outokumpu](#)
 - [From Chrome ore to Stainless Steel](#)



Work safety at the Tornio plant area



Welcome to the
Tornio plant
area!



Safety
concerns all of
us



Safety at the
plant area



Safety while
working



Emergency
management



Conclusion

What does safety mean to us?

We are all responsible for our own safety and caring for the safety of our colleagues

We will follow procedures and evaluate risks before we act



SAFETY STARTS WITH ME



SAFETY BEFORE VOLUME



NO SHORTCUTS



NO REPEATS

ZERO ACCIDENTS

Safety takes priority over all other activities, including production

We will investigate all incidents and take actions to prevent re-occurrence, anywhere

Get to know the plant area 1/3

→ Ferrochrome plant

→ Steel melting shop

→ Hot rolling mill

→ Mill Services

→ Cold rolling mill and RAP5

→ The port

→ Cargo gate



Get to know the plant area 2/3

→ Main gate

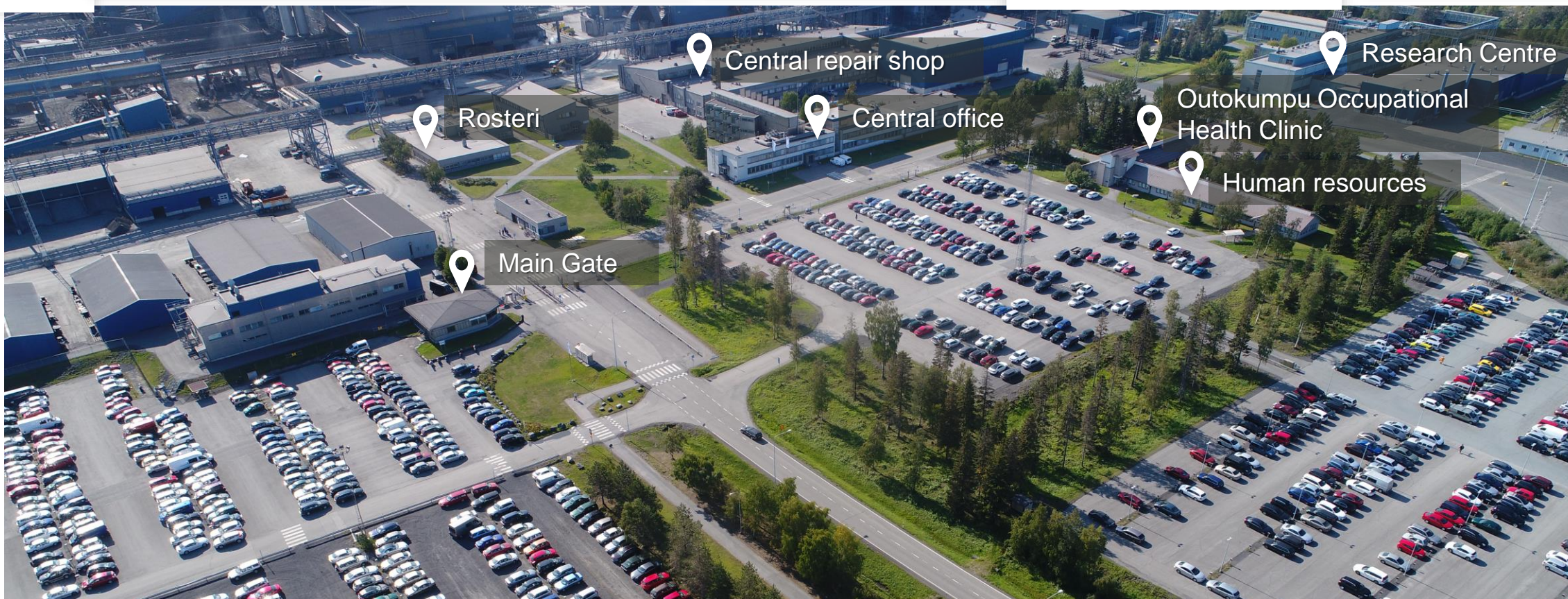
→ Canteen Rosteri

→ Central repair shop

→ Central office

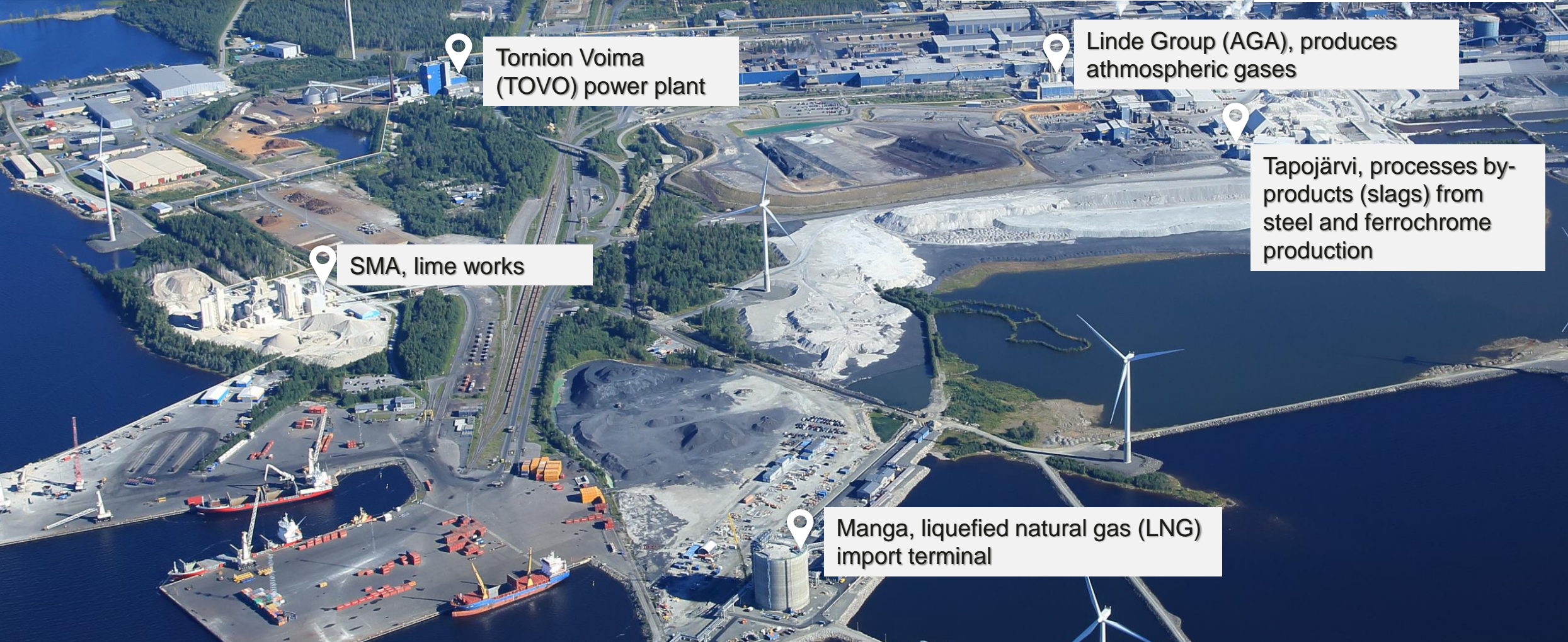
→ Occupational Health Clinic and HR

→ Research Centre



There are several companies directly involved with the production of ferrochrome and steel that operate inside the Tornio plant area or next to it

- Manga
- SMA
- Tornion Voima
- Linde group (AGA)
- Tapojärvi



Tornion Voima (TOVO) power plant

Linde Group (AGA), produces atmospheric gases

Tapojärvi, processes by-products (slags) from steel and ferrochrome production

SMA, lime works

Manga, liquefied natural gas (LNG) import terminal

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Conclusion



Think before you act!

- Safety starts **with you**
- Before you start working, consider at least these things:
 - Do I know how to perform the task safely?
 - Am I using a correct personal protective equipment?
 - Hazards related to the work?
- Take couple of minutes to think about safety before you start working (last-minute risk evaluation or “Tuumatuokio” in Finnish)
- Think about safety also during working if there are changes in work.



Think before you act!

If you can answer YES to the following questions, you will be able to carry out your work in a safe and secure manner:

1. Do you know how to perform the task safely?
2. Do you have a permission to start the work?
3. Do you have the proper tools and instructions?
4. Are you using the proper protective equipment?
5. Is the work area safe and secure?
6. Are you aware of the risks associated to the work?


If you can't, read the other side.


Unsure? Do the following before you start

1. Find out how to perform the work safely.
2. Find out the relevant instructions.
3. If you observe safety deficiencies, fix them.
4. Ask management or colleagues for additional instructions.

Remember that conditions might change during the task.

**Always follow the instructions!
"Keep it zero" with Outokumpu!**

outokumpu 

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We are all responsible of work safety



➔ **Responsible** for the risk factors of our operations, their removal and the instructions related to them.

➔ **Provides** contractors with information on safety aspects and requirements.

➔ **Follows** Outokumpu safety instructions

➔ **Provides** the client information about the hazards related to their own activities

➔ **Manages** their own operations and supervises their employees

➔ **Follows** given guidelines, regulations and work plans.

➔ **Keeps** the working environment clean and in good order and **takes care** of safety of themselves and other employees

➔ **Reports** all work related changes to supervisors before starting the work or as soon as the change is detected.

Acting against instructions

Remember, that everyone must intervene and report if they see someone breaking the safety rules!

The possible outcomes of these violations are based on severity, intent and repetition and can be:

- Notification and instruction to correct behaviour
- Written reminder
- Written warning
- Removal from the plant area

Remember that outcome is always case specific.

These actions are applied both Outokumpu employees and contractor/service supplier employees.

Ten Cardinal Safety Rules

All Outokumpu employees, contractors and visitors **WILL NOT:**

-  1. Attend the workplace under the influence of drugs or alcohol
-  2. Remove fixed guards before operating machinery
-  3. Bypass a safety control system
-  4. Cross under, through or over process equipment that is operating unless using prescribed walkways
-  5. Break procedures for boarding and deboarding cranes
-  6. Climb over, under or between railroad cars or trucks
-  7. Work on any machinery without first locking out all energy sources
-  8. Work at height without using correct fall protection equipment and a rescue plan
-  9. Enter a confined space without a second person in attendance outside and a rescue plan
-  10. Carry out any hot work unless it is in a designated controlled area or has a relevant permit

Cardinal Safety Rules 

- ✓ A Cardinal Safety Rule is one that, if violated, will pose an imminent threat to the safety of the individual and / or other personnel working around the individual.
- ✓ Deliberate violations of Cardinal Safety Rules will result in termination of employment with the company.
- ✓ Cardinal Safety Rules apply to all Outokumpu employees, contractors and visitors to Outokumpu facilities.

All Outokumpu employees, contractors and visitors **will not:**



1. Attend the workplace under the influence of drugs or alcohol.

Outokumpu employees, contractors or visitors must not be affected by drugs or alcohol while at Outokumpu premises. This may be subject to random testing or testing after an incident.



2. Remove fixed guards before operating machinery.

Fixed guards (e.g. barriers preventing access to moving machinery) on or around machines which are a permanent feature and require removal by a relevant tool must not be removed and left off from equipment before machines are started for operation.

All Outokumpu employees, contractors and visitors **will not:**



3. Bypass a safety control system.

Intentionally defeat the electrical or mechanical safety control system of the machine which may cause injury. This includes purposely navigating around fixed fencing or barrier interlocks.



4. Cross under, through or over process equipment that is operating unless using prescribed walkways.

Employees, contractors and visitors must always use designated walkways to access over, under or through process equipment. Under no circumstances will shortcuts over, under or through process equipment be tolerated.

All Outokumpu employees, contractors and visitors **will not:**



5. Break procedures for boarding and deboarding cranes.

Access to and exit from cranes must be performed from agreed designated access points to ensure the safety of employees and contractors.



6. Climb over, under or between railroad cars or trucks.

It is prohibited to climb over, under or between railroad cars or trucks to eliminate the risk of sudden movements and the possibility of sustaining a trapping and crushing injury.

All Outokumpu employees, contractors and visitors **will not:**



7. Work on any machinery without first locking out all energy sources.

Company LOTOTO (Lock Out, Tag Out, Test Out) procedures must be adhered to in order to lock off all energy sources before working on machinery (maintenance and repair), these will eliminate the chance of machinery being inadvertently started causing injury.



8. Work at height without using correct fall protection equipment and a rescue plan.

All work at height must be assessed before starting the task and performed using the correct protection equipment, this must also include an adequate rescue plan.

All Outokumpu employees, contractors and visitors **will not:**



9. Enter a confined space without a second person in attendance outside and a rescue plan.

All work which involves confined space entry must be assessed before starting the task, and must include an adequate rescue plan which incorporates a second person in attendance who can initiate the rescue plan if required.



10. Carry out any hot work unless it is in a designated controlled area or has a relevant permit.

Designated controlled areas for hot work must be defined and documented (usually maintenance areas) or supplemented by the local relevant hot work permit which includes fire watch duties.

Work safety at the Tornio plant area



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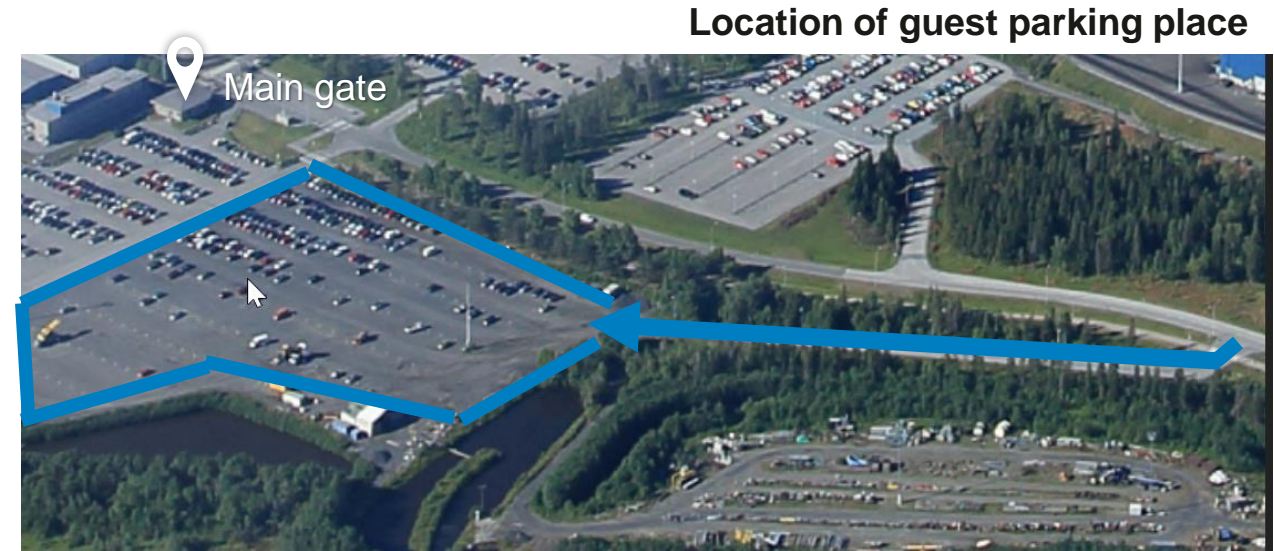
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Conclusion

Arriving to plant area

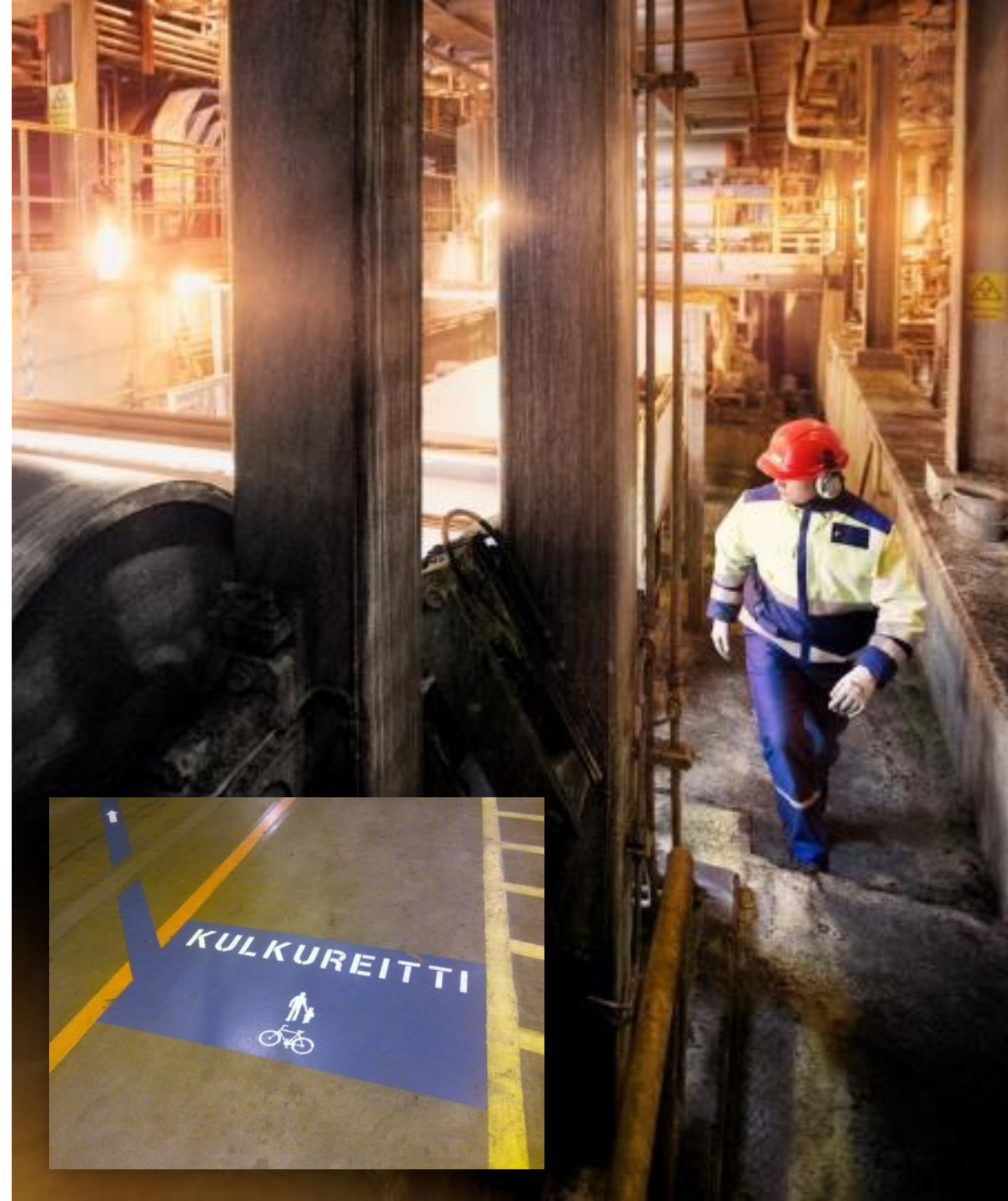
- When arriving to the area, park your car in the car parks located outside the Tornio plant area
 - External employees must park in the guest parking place
 - If you need a car inside the plant area you must apply for special driving permit in advance
 - Only driver may enter the area in the car, all passengers must use personnel gates



- To access the plant area you must have a personal electronic access pass
 - You can apply the access pass after passing this training and exam and sending an access pass application before you start working in Tornio plant area
- Plant area is monitored and protected around the clock using electronic security systems.
 - Access control at gates and camera surveillance in the area

Passenger traffic

- Keep in mind that in Tornio plant area there is a lot of heavy traffic with limited visibility from the cabin
- When moving in plant area or inside buildings, use pedestrian walkways and personnel doors
- In production areas pay attention to the movements of the crane and do not go under the load
- You can prevent slipping and tripping accidents by moving carefully
- To prevent the risk of tripping in stairs, hold the railing at least with one hand
- Cycling is allowed only in certain work tasks
- Always notice the safety signs, such as prohibition signs, warning signs and mandatory action signs (for example required personal protective equipment), when entering different areas and moving around the area.



Vehicle traffic



- Passenger cars and vans enter the plant area using the main gate while heavy traffic enters using the cargo gate
- Private motor vehicles such as mopeds, scooters and motorcycles are not allowed in the plant area

- The general speed limit is 30 km/h
- Vehicle's speed is monitored regularly

- All work vehicle drivers must have a valid license for the vehicle they operate. They are also responsible for vehicle being in service condition
- Outokumpu forklifts can only be used by trained personnel who have a written permit

Forklift's working area

- Entering and working in forklift working area, such as the area used for loading and unloading, is prohibited
- If pedestrian needs to pass close to the working area they must ensure that forklift driver has noticed them
- Definition for forklift working area doesn't apply to a forklift moving in plant area from place to another.



The forklift operator is responsible for isolating forklift's work area with, for instance, barrier tape or bars if it is possible that other people enter the working area.

Trains and vehicles

- Automated trains and vehicles are used for the transport of coils, molten metal and scrap.
- They always have the right of way and their routes must be kept clear.
- Only trained personnel are allowed to operate them or handle possible breakdowns.



This train carries molten ferrochrome from the ferrochrome plant to the steel melting shop



Pictured here is an automated guided vehicle at the cold rolling mill

Additional instructions applicable to us all

Gas bottles

It is forbidden to bring in or use one's own gas bottles in the plant area

The use of knives is prohibited

Use of knives in the Tornio plant area is forbidden – use replacement tools instead

Headphones

The use of headphones during working time, for example for listening to music, is not permitted as the music may interfere with the employees ability to hear an alarm signal

Zero tolerance for workplace bullying

Outokumpu does not tolerate any forms of bullying or harassment

Jewelry and other related accessories

Due to entanglement hazard it is not allowed to wear jewelry or related accessories (for example rings, wristwatches, bracelets, necklaces, scarves, ties) in production facilities or other similar facilities.

Using a mobile phone while moving in the plant area is prohibited. This applies to walking as well. Stop while on a phone call or when using a mobile phone for other purposes.

Data security

- Any type of filming, recording or picture taking in the plant area is prohibited
- In addition, one cannot use any other means either to disclose information related to Outokumpu's production processes, economy or other confidential matters to third parties

We have zero tolerance for alcohol and narcotic substances



- It is strictly forbidden to use alcohol or other narcotic substances or be under their influence at the workplace!
- Smoking is allowed only in marked places. This applies also for electrical cigarettes.

Regular breath analysis tests are conducted at the gates



Occupational hygiene

An aerial photograph of an industrial complex, possibly a refinery or chemical plant, set in a winter landscape with snow-covered ground and trees. The facility features several large buildings, pipes, and structures, with some smoke or steam rising from the area. The background shows a vast, flat landscape under a pale sky.

- The hazardous substances used in our production areas can be transferred to the human body by inhalation, through the skin and through the mouth, for example via dirty hands when eating or smoking.
- **You can minimize the exposure to hazardous substances by using the required personal protective equipment.**

The canteens can only be entered in clean clothing.

- Leave your work coat in the coat rack
- When wearing an overall, the upper part of the clothes must be rolled down to the waist
- Don't forget to wash your hands and face as well

Environmental protection supports sustainable development

- We aim to minimize emissions and their impacts on the environment
- Possible accidents must be reported to Outokumpu personnel
- Major oil or chemical leaks must also be reported to the main gate
- Sorting of wastes is a part of our controlled environmental protection

→ What sorting instructions look like?

SORTING INSTRUCTION FOR METALS AND WASTE	
METALS, blue color	<ul style="list-style-type: none">• Stainless steel scrap• Acid-proof steel scrap• Black steel scrap• Other steel scrap (aluminium, copper, brass, bronze etc.) <p>→ Sort different steel scraps in their own bins</p>
HAZARDOUS WASTE, red color	<ul style="list-style-type: none">• Lubricating oil• Oil-water mixes• Dissolvents• Oily solids and pastes• Paints, inks, varnishes, glues and waxes• Non-freezing solutions• Clutch and brake fluids• Acids• Bases• Used accumulators• Battery waste• Mercury discharge lamps and fluorescent lamp• Aerosol packages <p>→ All hazardous waste mentioned above in their own bins</p>
ENERGY WASTE, orange color	<ul style="list-style-type: none">• Plastics (no PVC)• Dirty cardboards and papers• Plastic coated cardboards• Styrofoam• Papertowels• Plastic helmets• Bulk bags (FIBC)
WOOD WASTE, yellow color	<ul style="list-style-type: none">• Wood that is unsaturated and appropriate for fuel wood to the demountable platform
RECYCLE PAPER AND CARDBOARD, green color	<ul style="list-style-type: none">• Brown fibre: cardboards, carton, and kraft to cardboard cage• Office papers (with staples), magazines, advertisements, envelopes (also with plastic windows), books with covers and office cardboards (i.a. notepad covers), to green recycle bins• Do not put in the recycle bin: wet or dirty paper, tissues, aluminium paper, brown paperbags, cans made from cardboard, etc. packages and other things which are not classified as a paper
LANDFILL, grey color	<ul style="list-style-type: none">• No hazardous waste• No metals• No wood• No paper or cardboard
ORGANIC WASTE, brown color	<ul style="list-style-type: none">• Food• Coffee filters with coffee grounds• Kitchen towel and paper napkins• Other composting waste

From the environment system you can find more information about waste sorting!

Environmental permit and limit values

- The environmental permit sets the ground rules for our operations
- The effects of our operations are monitored in accordance with the monitoring programs agreed with the authorities
- Limit values have been set for emissions
- We handle our processes and emissions purification equipment carefully so that the load remains as low as possible under all conditions



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Conclusion

Avoid hazards by protecting yourself properly

- Using appropriate protective equipment is an easy way to increase your safety at work.
- Below you can see list of mandatory protective equipment in all our departments.



Safety glasses



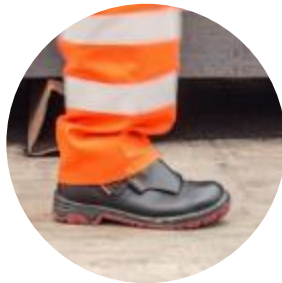
Industrial safety helmet and hearing protection



Safety gloves that protect you against the hazards of your work



Anti-flame protective clothing



Safety shoes, with penetration-resistant sole

Assess the risks before you start the work!
Examples of hazards related to hand safety:

- Cuts
- Stack wounds
- Chemical exposure
- Burns and frostbites

Examples of special protective equipment required by a specific task or working area



Safety helmets' chin strap

- In places where's a risk of falling when working in heights, the helmet must have a **chin strap attached** under the chin



Welding helmet

- In areas where's an obligation to wear a helmet, a helmet must also be used for welding work



Sealed safety goggles

- When working with an angle grinder and picking machine, use sealed face or eye protection



Respirator

- **Use respirator** when working in dusty work places



Safety glasses on outside areas

- Due to the dust, it's recommended to use eye protection all the time in Tornio site area



Cut resistant gloves

- Use cut resistant gloves when handling sharp tools / materials



Neck cover and visor

- Use neck cover and visor in areas which handle dangerous chemicals

Ground rules for working safely



Cleanliness leads to safety

Maintaining order and cleanliness is of great importance when it comes to safety. **Therefore, it is important to keep walkways clear and store away tools and equipment in a way that does not create a hazard.** It is often disorder and mess that leads to risks of tripping and slipping.

Keeping your work environment clean and in good order improves both the overall occupational safety and job satisfaction.

Isolating working areas

If the work can cause danger to others in the area, the work area must be isolated with barrier tape or bars. Such situations include, for example:

- Hoisting (lifting)
- Working in a personnel lift
- Working on a pipeline
- Constructing and dismantling scaffolds

It is important to respect isolated areas. **Do not cross, pass under or move the barrier tape or bars without permission**

Ground rules for safety

Electrical safety

Only electricians are allowed to perform electrical installations

The electrical safety of the Tornio factory area is ensured using the following means:

- **Defective/broken electrical devices are immediately taken out of use** and sent to repair
- **Extension cords** crossing passageways are **marked and protected**
- **Entry to electric rooms requires** a permission and special training
- When working in moist or confined conductive surrounding such as metal containers it is mandatory to familiarize oneself with the more detailed safety instructions

Hot work

At the Tornio plant, all hot works are done according the Hot work manual. Hot works require following safety procedures:

- **Written hot work permit.** Temporary hot work locations require a valid hot work card.
- First-aid **extinguishing equipment** that comply with standards. **Do not borrow extinguishers from marked places.**
- **Non-flammable protective clothing.** The person guarding hot works must wear a **high visibility vest**
- Conveyers, cables and combustible structures must be **protected**
- All flammable material must be removed. In Addition, it's important to prevent sparks from spreading to adjacent spaces.
- At least two hours **post hot work guarding**

Check-in procedures

- Get a work permit from the management of the area
- Always check-in with the area's control room personnel before starting the work
- Every check-in must be recorded
- After finishing a task or a shift, remember to check-out
- Check-in procedures apply contractors and Outokumpu personnel who normally don't work in the area



Tasks that require a written permit

There are tasks in Tornio plant area that require special skills, qualifications and special risk management procedures. Safety of these tasks is ensured with our written work permit procedure.

- 1) When work is supervised by a contractor. Excluding instructed standard work defined by the buyer, works in office and outdoor areas performed by property and maintenance service companies or inspection walks and visits performed by supervisors and work planners
- 2) Prevention of un-expected start up of a machine if there is no written instruction available
- 3) Hot work and hot work on roofs (hot work permit)
- 4) Work done in confined or closed spaces such as containers or exhaust gas pipes
- 5) Working in the danger zone of a crane or near the electrical cables or crane (e.g. construction of scaffolds in such locations)
- 6) Work related to chemical and gas pipes and equipment
- 7) Pressure equipment and related piping
- 8) Work in EX-rooms
- 9) New excavations works in the plant area, works in the dams and works effecting cleanliness of waters
- 10) Works in the NeRe area and in the CO2 danger zone
- 11) Work on roofs of production units. Excluding instructed standard works performed by the property and maintenance service companies
- 12) Works with the risk of falling if there is no documented risk assessment
- 13) Working on a straight ladder (only in special cases)
- 14) Troubleshooting in a danger zone while production is ongoing
- 15) Situations where the energies of the machine or equipment can not be completely isolated
- 16) Use of angle grinder (Hot work permit if the workplace requires a Hot work permit and work permit if the workplace does not require a Hot work permit)
- 17) Other hazardous works specified by the area's management

Prevention of unexpected energization or start-up of machines

It is not allowed to work or move in danger areas of the machines and equipment before unexpected start-up has been prevented. Follow instructions below (Lock Out, Tag Out, Test Out, LOTOTO procedures) before going to the danger area of machine or equipment.

1. Check-in

Check-in to the area's control room personnel and record your check-in. Identify the hazards of an unexpected start-up of the work site.

2. Isolate energies

Isolate energies after receiving permission to do so. Energy sources to isolate include for example electrical, fluid, pneumatic, hydraulic and mechanical.

3. Lock Out and Tag Out

Perform the necessary lockings and add start-up prohibition signs. Each person involved in the work participates in the lockings with their own personal lock.

One person - One lock

4. Verify successful isolation - Test Out

Ensure that the isolation of energies has succeeded, for example by testing.

5. Ensure it is safe to start the work

Ensure from the supervisor that it is safe to start the work. Work can begin once permission has been obtained.

6. Finish the work

When the work is completed and all persons have left the danger area, the locks are removed. The main rule is that the lock may only be removed by the person who set it. Finally, check-out to the area's control room personnel and record your check-out.

Working at heights and lifting

Lifting

In order to ensure the safety of lifting work, the following things must be taken into consideration in the Tornio plant area:

- **Cranes can only be used by trained persons who have been given a written permit**
- Only lifting gears and tools suitable and approved for the lifting in question should be used
- The condition of lifting equipment and tools must always be checked before lifting
- **Do not go under the load or in a narrow gap**
- Do not leave the load on crane to hang
- You must use a steering rope or other tools to steer the load
- A written lifting plan must be drawn up for demanding lifting

Working at heights and lifting

Protection is the key

You must ensure that falling is prevented in all situations and during all works

The best fall protection system is one that prevents access to an area where falling is possible. This can mean a properly sized rope and its anchorage point for example

In personnel lifts, fall protection harness attached to the lifting basket must be used at all times

Keep in mind, that barrier tape is not a railing!

Scaffold

The scaffold may only be erected, dismantled or modified by a person who is trained to carry out scaffolding work.

Always check the scaffold before working:

- The scaffold must have an inspection tag. If it is missing, the scaffold may not be used.
- Access to the scaffold should be securely arranged, primarily along the stairs. The ladder route is only allowed in confined spaces.
- Scaffold must have safety rails and toe boards
- Also check the working level locks and general cleanliness

When the scaffold is erected in the overhead crane's movement area, a written work permit is required.

Working at heights and lifting

Working on top of each other

The rule of thumb is that working on top of each other on different working levels is prohibited. This is due to, for example, the risk of falling objects.

Work must be planned in such a way that no tasks are performed in overlapping levels at the same time.

Ladders

It is forbidden to work on a straight ladders. They can only be used as a temporary passageway and for attaching/removing a small and light lifting tool or fall protector arrester

A-ladders can only be used as a work platform if it is not reasonable to require the use of a work platform, scaffold or a personnel lift.

Works with the risk of falling

Before starting works with the risk of falling, risk assessment must be carried out.

While working, it is important to use appropriate fall protection equipment and to wear a helmet with a chin strap. There must also be an appropriate rescue plan made by person in charge.

The connection of the personal fall arrestor during work and moving must be ensured, for example, by means of a double tie off lanyard (Y-lanyard) which allows moving horizontally while being continuously attached

Chemicals at the Tornio plant

There are several hundreds of different chemicals handled in Tornio plant e.g. raw materials, process chemicals, lubricants and chemicals for maintenance purposes.

Please note that some of the chemicals used in the area pose a risk to reproductive health.

- For example carbon monoxide, ceramic fibers used in furnaces and sulfuric acid fumes
- For more information, contact your occupational healthcare provider



Some hazardous chemicals at Tornio plant

Corrosive substances:



- Hydrofluoric acid and Sulphur dioxide
- Other corrosive substance: Sulfuric acid, Nitric acid, Sodium hydroxide, Ammonia solution

Toxic substances:



- Carbon monoxide
- Hydrofluoric acid and Sulphur dioxide

Chronical health hazard:



- Carbon monoxide
(may damage the unborn child)

Highly flammable substances:



- Natural Gas
- Carbon monoxide
- Hydrogen

Oxidising substances:



- Oxygen



Also nitrogen and argon gases are handled and stored at the plant

Always check the chemicals used and stored at the working place!

The hazards are described best in the Chemical Safety Data Sheet of a substance

Specific hazards of the departments

Ferrochrome plant

Technical services

Hot rolling mill

Steel melting shop

Cold rolling mill and RAP5



Hazards in the ferrochrome plant



Get to know the Ferrochrome plant

At Ferrochrome plant Ferrochromium is manufactured from chromite concentrate trucked from the Kemi mine.

The Ferrochrome plant consists of coke drying, sintering, three submerged arc furnaces and customer material handling.

Molten metal and slag

Ferrochromium and slag, temperature as molten $> 1500\text{ }^{\circ}\text{C}$.

Moving is restricted at areas with high risk of splashes of molten materials (tapping area, casting area, transport of molten metal)

Mobile machinery

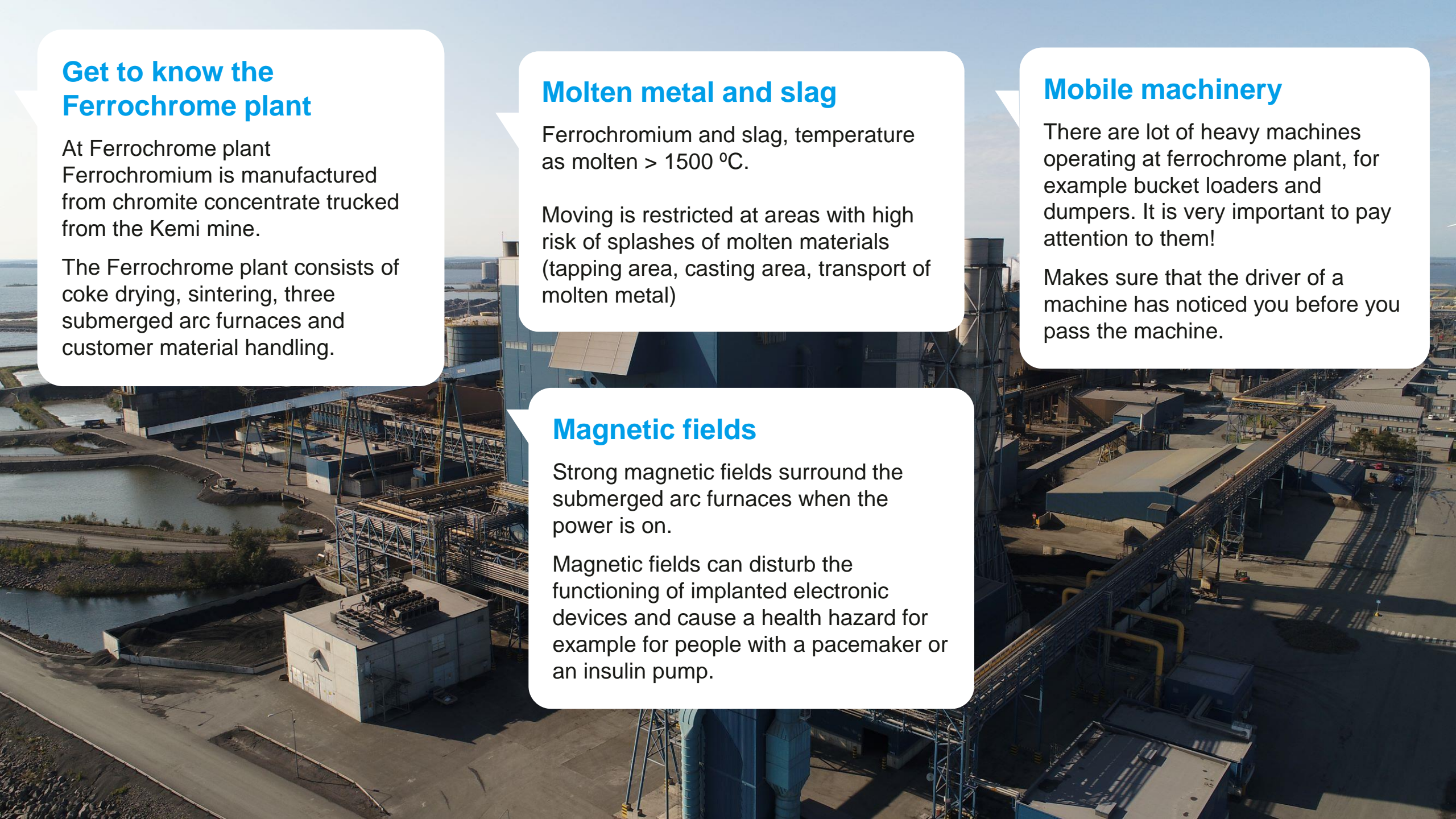
There are lot of heavy machines operating at ferrochrome plant, for example bucket loaders and dumpers. It is very important to pay attention to them!

Makes sure that the driver of a machine has noticed you before you pass the machine.

Magnetic fields

Strong magnetic fields surround the submerged arc furnaces when the power is on.

Magnetic fields can disturb the functioning of implanted electronic devices and cause a health hazard for example for people with a pacemaker or an insulin pump.



Asbestos

Asbestos is a mineral fiber present in the concentrate trucked from Kemi mine. Asbestos fibers are so small that they cannot be seen.

Airborne asbestos fibers attach to lung tissue and they don't remove when breathing out.

At Ferrochrome plant asbestos risk areas are divided into two categories based on the risk: yellow and red

When working or moving in **red areas** it is always mandatory to wear breathing protection and disposable overall.

In yellow areas it is mandatory to wear breathing protection and in dusty works disposable overalls in addition.

When leaving the asbestos danger area, always exit through asbestos removal and cleaning unit to prevent the fibers from spreading into **clean, green areas**.

Check the area category (red/yellow) from you Outokumpu contact person.

Carbon monoxide

Carbon monoxide is a by-product of smelting process. It is colourless, odourless, tasteless and cannot be seen, smelled or tasted. It is toxic if breathed in.

People who are working at Ferrochrome plant must always have a portable CO meter. The contents of CO gas is also monitored using fixed detectors.

Symptoms of CO poisoning include strong headache, nausea or vomiting, dizziness and shortness of breath.

As a first-aid exposed person must be moved into fresh air and give medical oxygen. If a person doesn't breath start resuscitation.

Hazards in the Steel melting shop



Hazards in production halls

In production halls, molten steel is transported through cranes in brick-lined metal containers, ladles

There is a risk of splashes, heat radiation and bursting to release molten steel into the environment

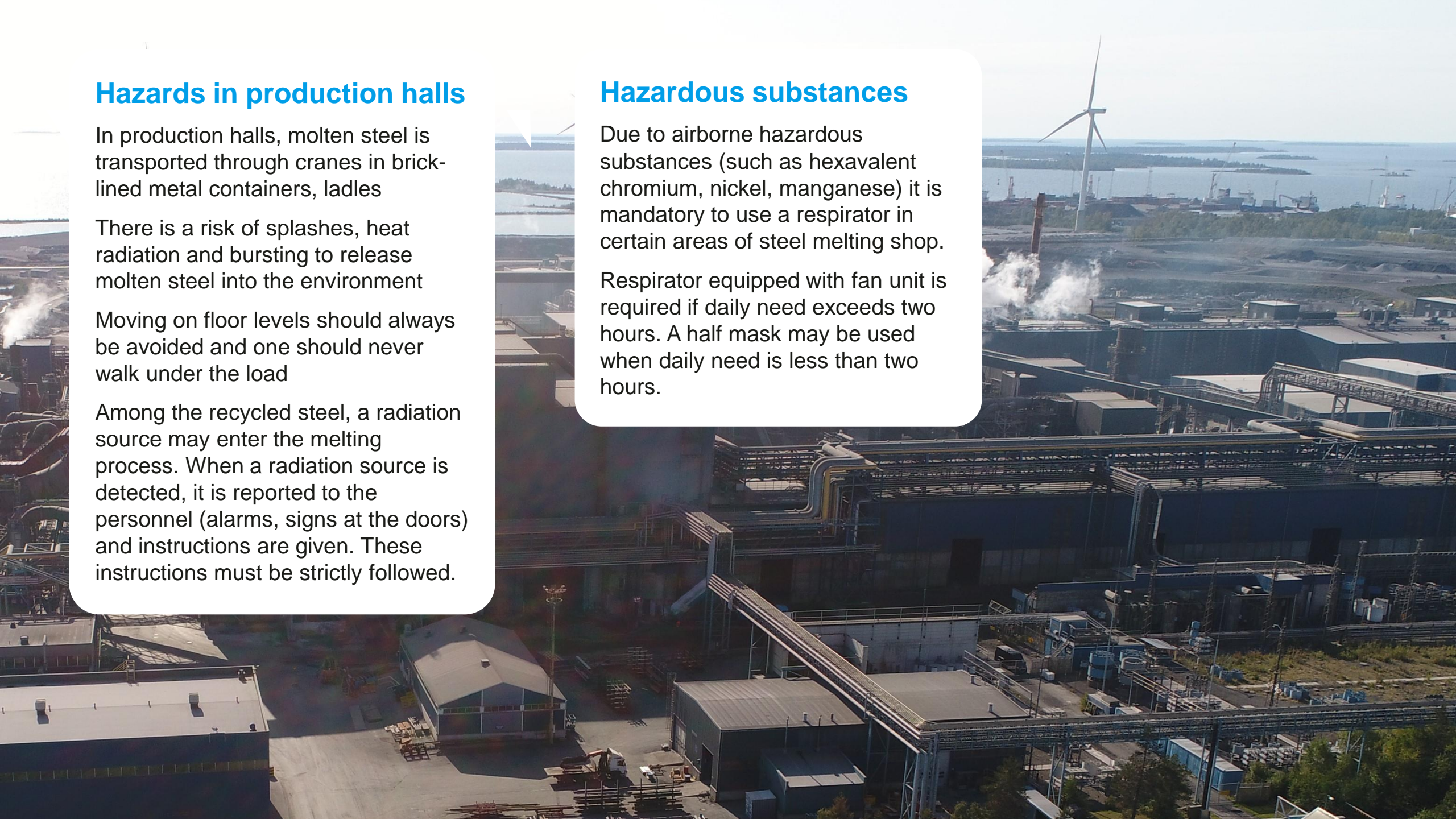
Moving on floor levels should always be avoided and one should never walk under the load

Among the recycled steel, a radiation source may enter the melting process. When a radiation source is detected, it is reported to the personnel (alarms, signs at the doors) and instructions are given. These instructions must be strictly followed.

Hazardous substances

Due to airborne hazardous substances (such as hexavalent chromium, nickel, manganese) it is mandatory to use a respirator in certain areas of steel melting shop.

Respirator equipped with fan unit is required if daily need exceeds two hours. A half mask may be used when daily need is less than two hours.



Magnetic fields

Strong magnetic fields surround the electric arc furnaces when the power is on.

Magnetic fields can disturb the functioning of implanted electronic devices and cause a health hazard for example for people with a pacemaker or an insulin pump.

Slag vehicles

Slag vehicles transport molten slag and cause a risk of splashes.

Slag vehicles are very heavy and they are slow to stop, remember to keep a safe distance.

It is forbidden to go in slag handling area because of the risk of splashes and explosion.

Gases

Steel melting shop uses large amount of different gases:

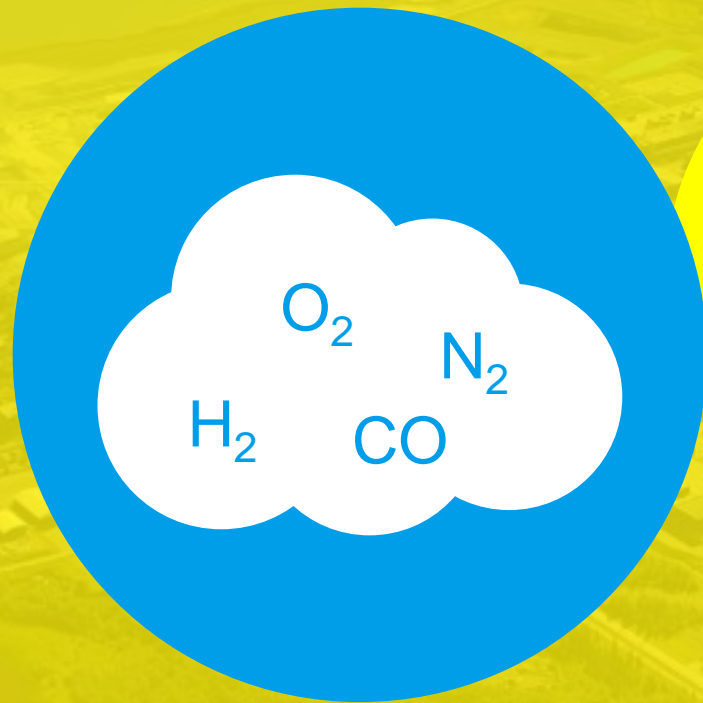
- Natural Gas – dryers and heaters in the area
- Oxygen O₂ – converter process and burners
- Nitrogen N₂ , Argon Ar – process gases

There is a fixed detectors and alarm system.

Before starting the work check what gases are used at that area and what procedures you must follow to ensure the safety!



Hazards in the Hot rolling mill



Gases

The hot rolling mill uses large quantities of gases in walking beam furnace and bell annealing furnace.

Gases used in WBF are:

- Natural gas
- Carbon monoxide
- Oxygen

Remember to check in at area's control room!

Gases used in BAF are:

- Hydrogen
- Nitrogen

When working in walking beam furnace or bell annealing furnace area, carrying a multi-gas meter is required.

There is a fixed gas detectors and alarm system for natural gas, carbon monoxide and oxygen.

In case of a leak, there is a light flashing and a sound alarm in the alarm system. Remove yourself from the area immediately!

Radiation sources

The hot rolling mill strip mill has radiation-based measuring devices that are very powerful. There are warning lights in both sides of the strip mill that show when the device is on.

When working near the devices they must be in safe mode and work in them must not be started without induction to the area and portable radiation meters.

Hazards in the Cold rolling mill



Get to know the Cold rolling mill

The cold rolling mill employs about 710 people and has 23 production lines. Therefore, material transport and passenger transport in the area are lively.

Carbon dioxide

The cold rolling mill uses carbon dioxide as a fire extinguishing agent. At high concentrations carbon dioxide is life threatening to humans.

Working in the lines equipped with carbon dioxide extinguishing equipment requires the use of a separate hazard area work permit and a rescue device.

In the event of a carbon dioxide alarm, exit the danger area and follow the given instructions.

Hazardous substances

Most important chemicals used at the Cold rolling mill are hydrofluoric acid, nitric acid and sulfuric acid. Also, natural gas (NG) and carbon monoxide (CO) are used.

There are marked areas where chemicals are handled and requirements for additional personal protective equipment which include visor attached to helmet, neck protector and chemical resistant gloves.

In these areas a written work permit is mandatory.

Automatic cranes and AGV's

Never enter to areas where automatic cranes operate.

Never enter designated passage routes for automated guided vehicles (marked with high visibility chains).



Hydrofluoric acid, HF

- Gaseous hydrofluoric acid is colourless. It has a very irritating smell.
- Hydrofluoric acids absorbs through the skin and causes burns on skin and tissue under it.
- In the air it causes irritation to eyes and respiratory tract. High concentrations can cause severe, painful injuries to the skin, eyes and mucous membranes. Vapours can cause respiratory tract corrosion and pulmonary edema.
- Symptoms may take long time to develop.



H330: Fatal if inhaled

H310: Fatal in contact with skin

H300: Fatal if swallowed

H314: Causes severe skin burns and eye damage

Hazards in Technical services

Get to know the Technical services

Technical services are a part of Mill Services. Technical services are responsible for energy and water supply plants, cleaning services, construction and infrastructure services, service contract control, and co-ordination of planning and information management.



Water treatment plant

Water treatment plant supplies the Tornio plant with water for different needs. For this purpose hazardous chemicals are used, such as:

- Sodium hypochlorite
- Sulfuric acid
- Caustic soda
- Hydrochloric acid



Energy plant

The most important hazards of energy plants are natural gas and carbon monoxide.

For this reason, when working at work sites, the personnel must always have a multi-gas meter with them to detect and prevent exposure to these gases.

There are also high levels of noise in energy plant and it is important to protect your hearing as instructed.

Work safety at the Tornio plant area



Welcome to the
Tornio plant
area!



Safety
concerns all of
us



Safety at the
plant area



Safety while
working



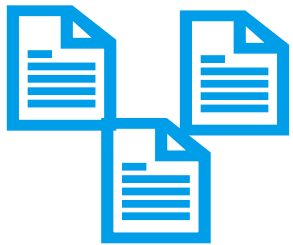
Emergency
management



Conclusion

Preventing and preparing is the key

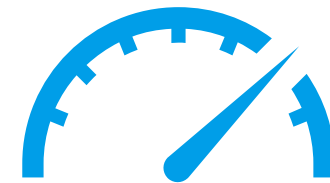
- Outokumpu's primary goal is to prevent incidents from occurring, and it is therefore important that the work permits and check-in procedures are strictly followed.
- Carrying portable meters in locations where different gases can be present is an important part of the emergency preparedness. The plant area and departments also have fixed gas detectors and alarm system.
- Remember that in the case of a leak, people working on the area are notified with a flashing light and an alarm sound. In this case, everyone must leave the danger area immediately. All leaks should also be reported immediately to the control room.



Work permits



Check-in procedures



Meters, detectors and alarm systems

Warning of personnel in danger and emergency situations

Fire

Fire is indicated by a fire alarm, and additional information is provided, if necessary, via an emergency alarm system. The most important thing is to leave the area immediately and go to the evacuation assembly point.

Gas and chemical accidents

Emergency situations are reported through emergency alarm system and/or general alarm signal. Depending the situation, people will be either asked to exit to the evacuation assembly point or stay inside.

Other hazardous and emergency situations

Hazardous and emergency situations such as radiation or emissions are reported, if necessary, through emergency alarm system and/or general alarm signal or in the Outokumpu's intranet (O'net)

General alarm signal

→ In case of general alarm signal

- If you are outside – move inside
- If you are inside – stay there
- If you can't go inside, move towards side wind from the gas cloud



General emergency signal is one minute long up and down signal that will be repeated several times in case of an emergency



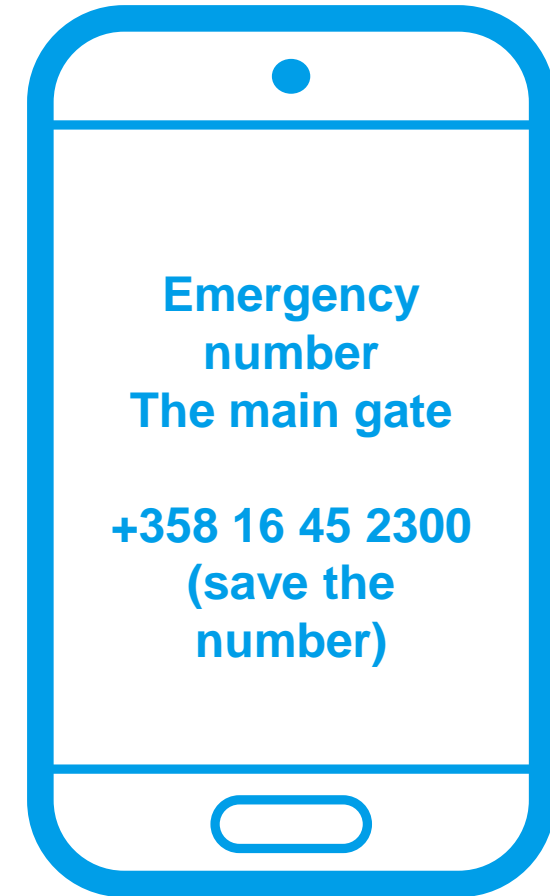
Emergency is over signal is one minute long signal.

In Tornio plant also fires are notified using the same signal

Tornio plant emergency number

When you call to the number, make sure to

- State your name, the department/area you are calling from and the nearest door number
 - Describe what has happened
 - Advise on how many people were injured and what are their injuries
 - Describe the type of help that is needed
 - State the accurate accident location
 - Inform how the help will be guided to the site
-
- It is important to call the Tornio plant emergency number in order to get help as soon as possible.**
 - After having been alerted, the main gate will send the plant's first aid and fire fighting teams to the location.
 - The main gate will also alert and guide all external rescue vehicles to the accident site.



In case of resuscitation (CPR), after calling to the Tornio plant emergency number, also call to the emergency number 112 so that emergency care can receive situation information directly from the emergency site.

Accident situations



First aid can save lives

Exposure to chemicals

SKIN

Remove immediately contaminated clothing. Wash skin with plenty of running water. Continue washing the skin with water and soap for at least 15 minutes.

SPLASH IN THE EYE

Rinse the eye with plenty of water for 15 minutes, keeping the eye lids open. Prevent the rinse water from entering the clean eye.

RESPIRATORY

Move the person into fresh air, place them in a half-sitting position

INGESTION OF CHEMICALS

If the person is not unconscious or cramping, rinse their mouth and give them a couple of glasses of water. Do not induce vomiting.

Exposure to hydrofluoric acid

SKIN

Remove immediately contaminated clothing. Wash skin with plenty of running water. Then apply immediately substantial amount of calcium gluconate gel over and around skin lesion and rub the area until pain stops. Note that the gel cannot be applied in the eyes. Finally, give six chewing pills containing calcium.

SPLASH IN THE EYE

Rinse the eye with plenty of water for 15 minutes. Give the exposed person six chewing pills containing calcium.

RESPIRATORY

Move the person into fresh air and if necessary give them oxygen or resuscitate them. If the patient is conscious, give them six chewing pills containing calcium

All incidents and accidents must be reported

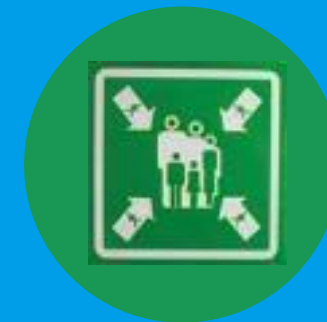
- **All workplace injuries**, including those where self administered first aid is sufficient such as putting a bandaid on a wound.
- **Near-misses**
- **Fires and self-sustained ignitions**
- **Damages to property and environment**
- **Chemical and gas leaks**



Upon arriving at the site, arrange with the area's supervisor or your own supervisor a work place induction that covers at least the following things:

1. moving in/to the area,
2. personal protective equipment requirements,
3. the hazards of the working environment,
4. accident risks,
5. the location of fire-extinguishers and first aid emergency equipment as well as emergency showers,
6. emergency exits and evacuation points,
7. safe places in gas leak situations,
8. waste sorting and recycling points,
9. closest door number,
10. contact persons and the closest control room.

Your actions have an impact



Work safety at the Tornio plant area



Welcome to the
Tornio plant
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Safety
concerns all of
us



Safety at the
plant area



Safety while
working



Emergency
management



Conclusion

Conclusions

Now you know,

- How different tasks are carried out safely and what are the instructions we all must comply with
- How to evaluate the hazards of work and working environment before starting the work and during it
- What are the specific characteristics and hazards of Tornio plant area



- ✓ **Safety before volume**
- ✓ **Safety starts with me**
- ✓ **No shortcuts**
- ✓ **No repeats**