TO 200 HOT WORK SUPERVISION PLAN

Updates to the previous version are in red font.

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1 Obligations and purpose

Outokumpu's Tornio plants and Kemi mine comply with the company's own hot work supervision plan, which is a standing guideline on the safe performance of hot work, in all hot work and roofing and waterproofing hot work. The hot work supervision plan is based on the Federation of Finnish Financial Services' hot work safety regulation 2016, attached to the insurance contract, and the SFS 5900 Tulitöiden paloturvallisuus (2016-02-19) and SFS 5991 Katto- ja vedeneristysalan tulitöiden

paloturvallisuus (2016-02-19) standards. These guidelines and the Outokumpu Tornio plants' and Kemi mine's additional requirements for carrying out hot work safely must be followed in all hot work.

Outokumpu employees, contractors and visitors may not carry out hot work in places other than those specifically intended for hot work (permanent hot work area) or in other areas without a hot work permit. A temporary hot work site must always have a hot work permit applied for from the area manager, in accordance with the hot work control plan. Before starting work, the site must be reviewed with the hot work permit issuer, and the safety measures required by the hot work control plan must be taken. This is Cardinal Safety Rule No. 10. (Cardinal Safety Rules).

The departments must ensure that the hot work supervision plan and the content of standards SFS 5900 and SFS 5991 are known by all persons responsible for carrying out hot work. Procurement and supervision personnel ensure that the supervision plan is included in contract agreements that include hot work. The persons placing work orders at the departments ensure that the contractors comply with the requirements of the supervision plan.

Acts promoting the obligations and safety of hot work include the Rescue Act, Occupational Safety and Health Act, Criminal Code, Insurance Contract Act and Tort Liability Act. Legislation requires the employer to organize the work so that it can be carried out safely and to ensure that all employees know and are familiar with the safety regulations concerning work-related hazards. The company's own personnel and service companies must comply with the acts, decrees and safety regulations, and the different parties must maintain and enhance occupational safety at the workplace in cooperation.

2 Definitions of hot work

Hot work refers to work that generates sparks or uses a flame or other form of heat and constitutes a fire hazard. Hot work includes flame, electric and arc welding, flame and arc cutting, wheel cutting and metal polishing. Hot work also includes work in which a gas burner or other open flame is used, gas soldering is performed, a warm-air heater is used or another comparable tool that generates strong thermal radiation is used.

Roofing and waterproofing hot work refers to roofing or waterproofing work that uses a flame or other form of heat and constitutes a fire hazard. Welding and other hot work on a roof requires a hot work permit and a roof hot work card. Roofing and waterproofing hot work includes all hot work on a roof and, for example, drying the foundation with a flame or warm air, heating bitumen in a bitumen pot and fastening waterproofing by heating, and necessary auxiliary tasks relating to such work that generate sparks.

A hot work card is a certificate issued by the Finnish National Rescue Association SPEK of an acceptably passed hot work safety test that is valid for a fixed period. The card is valid for 5 years in the Nordic countries. A hot work card issued in other Nordic countries is also valid in Finland. A hot work card is required from the hot work operator and the issuer of the hot work permit, as well as from an external service provider's (contractor's) hot work guard. In addition, a hot work guard employed by Outokumpu is required to have a hot work card or training as a hot work guard provided internally by the plant.

A hot work card can also be a mobile card (QR code). For more information on this, see www.spek.fi/mobiilikortti. A hot work card issued in another Nordic country is also valid in Finland.

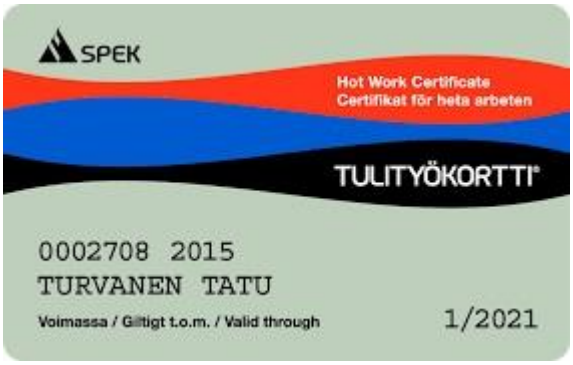

Figure 1: Finnish hot work card

A hot work permit is a written permit authorizing the performance of hot work at a temporary hot work site. Before issuing a hot work permit, an investigation and assessment of the hazards caused by hot work must be performed and the necessary safety measures specified.

The **hot work permit issuer** in the departments is the area's shift manager employed by Outokumpu or a separately designated person. This person is responsible for the hot work being performed in accordance with the hot work plan, the emergency extinguishing equipment and extinguishing agent being suitable, and the safety measures required by the hot work permit being taken before the commencement of hot work. If hot work continues over a change of shifts, the hot work permit must be updated in the original hot work permit or applied for again. Summer shift managers must also have hot work cards if they issue hot work permits for their area. The hot work permit issuer must visit the hot work site together with the hot work permit holder.

The hot work operator is the person performing the hot work specified in the hot work permit, who has a valid hot work card and sufficient qualification for hot work, and complies with the instructions issued. This applies to both the company's in-house personnel and service providers (contractors). The hot work permit holder ensures that the agreed safety requirements during the hot work are met and that the hot work site is clean.

The **hot work guard** is a person supervising that hot work safety is maintained in the hot work area. The hot work guard cannot be a hot work operator at the same time (SFS 5900 / 3.8). Hot work guards must additionally wear hot work guard vests. A hot work guard employed by Outokumpu is required to have a hot work card or training as a hot work guard provided internally by the plant. A hot work guard of an external service provider (contractor) must always have a valid hot work card. The hot work guard is bound to the work for as long as specified in the hot work permit, and the guard is responsible for the hot work to the issuer of the hot work permit.

The **hot work plan** is a written plan on the safe performance of hot work and roofing and waterproofing hot work.

Hot work guard training is training that takes at least two hours, with instruction on the use of emergency extinguishing equipment and risks and practices related to working at a hot work site. Firefighting team members are also required to have completed hot work guard training, if they act as hot work guards. Hot work guard training for those included in the firefighting team is organized once every three years in connection with fire training. Hot work guard training is provided to summer employees as necessary.

A **permanent hot work site** is a special fire compartment or other restricted area reserved for hot work, where hot work can be performed safely. Performing hot work at a permanent hot work site does not require a written hot work permit. The locations of permanent hot work sites in the plant areas can be found in the department safety database. A person working at a permanent hot work site does not need a hot work card.

A temporary hot work site where a written hot work permit is not required is a process space/"normal site" where the process contains flames or molten materials or the area is otherwise safe (e.g. Kemi mine open quarry area). Such areas are already well protected. If temporary hot work has to be carried out at the sites, protective measures in accordance with the hot work control plan must be carried out at the site and sufficient fire extinguishing reserved for the site. Such sites are listed in section 10 of this instruction.

A **temporary hot work site** is a site that does not meet the requirements for a permanent hot work site and where hot work may only be performed when it cannot be performed at a permanent hot work site. A roofing and waterproofing hot work site is always a temporary hot work site. A hot work permit and a hot work card are always required for working at a temporary hot work site.

A **temporary hot work site** can be valid for a longer period of time (several months) during annual maintenance, for example. In this case, the hot work permit does not need to be renewed separately each time. The requirements of a permanent hot work site are valid for such a hot work site in terms of protection and other such factors. When setting up a hot work site, the fire safety team of the central safety organization must approve the hot work site in a separate review with the responsible persons of the department.

Hot work with a minor fire hazard includes electric soldering work and use of hot air. Such work can be carried out at the electrical repair shop, where the hot work operator has assessed the risk of ignition and spreading of fire to be minor. In assessing the fire hazard, the working method, flammability of the worked material, flammable materials in the vicinity and other factors relating to fire hazard must be considered. Soldering work on the lines requires a hot work permit.

3 Persons responsible for hot work and right to carry out, issue a permit for and supervise hot work

Hot work or roofing and waterproofing hot work may not be commenced anywhere in the area of Outokumpu's Tornio plants or the Kemi mine without advance preparations, survey of hazards and protective measures. Moreover, a temporary hot work site must have a hot work permit. It is required at Outokumpu's Tornio plants and the Kemi mine that hot work operators at a temporary hot work site have a valid SFS 5900-compliant hot work card or a hot work card issued in another Nordic country. It is additionally required that the hot work permit issuer and hot work guard (excluding hot work guards employed by the company; see section 2 "Hot work guard") have a valid hot work card.

The hot work permit issuer must review the hot work site with the hot work operators. Before the commencement of work, an investigation and assessment of the hazards caused by hot work at the hot work site must be performed. The hot work issuer ensures that hot work is performed and supervised in accordance with the hot work plan. The issuer of the hot work permit defines the measures considered necessary based on the investigation and assessment of hazards caused by hot work in the hot work permit. Hot work may commence only after the hot work operator and hot work guard have ensured that the safety measures specified in the hot work permit have been implemented. The hot work permit must specify the hot work permit issuer, hot work operators and hot work guards.

If it is necessary to make disconnections from the hot work area to the fire alarm device or sprinkler system, these must be made in the departments by the area shift supervisor (OKTO P3). In other areas, the systems are disconnected by Caverion Suomi Oy's fire alarm system operators. If the disconnection/system shutdown lasts more than 24 hours, please notify Outokumpu Group's insurer.

The central safety organization is responsible for the hot work supervision plan, hot work permit system and guidance at Outokumpu's Tornio plants. The central safety organization is responsible for the hot work supervision plan, hot work permit system and guidance at the Kemi mine.

4 Investigation and assessment of the hazards caused by hot work

Investigating and assessing the hazards caused by hot work means continuously identifying the hazards caused by hot work at the hot work site and in its environment and assessing their severity. The hazards are investigated and assessed before issuing a hot work permit and whenever there are changes in the conditions of the hot work site. The necessary safety measures to prevent damage caused by hot work are determined based on the investigation and assessment of hazards.

5 Hot work permits

A hot work permit and roofing and waterproofing hot work permit is recorded and stored on the form template in the Occupational safety database. Four copies of the hot work permit are signed, the first for the issuer, the second for the hot work operator, the third for the hot work guard and the fourth for the guard during breaks, who can be the fire watch guard, if necessary. The permits are signed at the hot work site.

A hot work permit may only be issued for a fixed period. The hot work permit is hot work site-specific, and only the hot work specified in the permit is allowed at the hot work site. If the conditions of the hot work site change during the validity of the hot work permit, the hot work permit issuer must update the hot work permit to match the new conditions. The hot work permit date sign-offs are made by the permit issuer and hot work operator. When a shift changes, the hot work permit must also be updated to match the information of the shift manager responsible at the time, and so on.

The hot work permit issuer must be employed by Outokumpu. In production buildings, hot work permits are issued by the shift manager of the area in question, the supervisor employed by Outokumpu who primarily works in the area or projects, or another person designated by the department. The hot work permit issuer must go to the hot work site to inspect it together with the hot work operators and hot work guards. The hot work permit issuer must hold a valid hot work card.

At the Kemi mine, hot work permits are deposited in KATTi on a readymade form template. A hot work permit is only issued for the duration of the work shift in question. The permit is stored, printed and signed. The original signed permit is handed over to the person performing the hot work and a copy (copies) to the guard(s). The permit is stored in KaTTi and can be seen there. A paper copy of the hot work permit must also be archived for at least 6 months by the issuer of the hot work permit.

6 Safety measures

6.1 Work equipment

The work equipment of hot work operators (e.g. work clothing and hot work equipment) must meet the requirements of the SFS 5900 standard (appendix SFS5900).

The work clothing of hot work operators must be classified in accordance with EN 11611:2007. The requirements for equipment for hot work are similar to those in welding work. The requirements for welding work are presented in document “TO 113 Welding”

6.2 Alternative work methods

Due to the fire hazard of hot work, alternative work methods must always be first considered instead of hot work. These include machining methods and joining and cutting methods that do not generate sparks or use open flame, or the work is performed at a permanent hot work site. If alternative work methods (e.g., pad sawing, flange connections) are used, there is no need for the hot work permit procedure.

6.3 Safety precautions required to commence work

- A written work permit and hot work permit must be obtained.
- The hot work permit form is completed together with the hot work operators, and the main aspects are explained to them, which makes it possible to consider the safety issues influencing hot work.
- A temporary hot work site must be inspected by the hot work permit issuer and hot work operator before writing the hot work permit and commencing work, and any hazards and their protections should be reported.
- The persons responsible for hot work guarding during work and during breaks, and for fire watch after the work has been performed, must be appointed.
- It must be ensured that everyone working at the site knows the location of the nearest telephone and the internal emergency number of the Tornio plants, +358 16 45 2300, or the Kemi mine emergency number +358 16 45 3737, and knows how to report an emergency and use the emergency extinguishing equipment.
- The hot work site must be such that there is no flammable material or, if there is, it must be protected.
- The hot work site and its surroundings must be cleaned and protected. Flammable material must be removed and flammable structures protected. This means that the site must be cleared of materials such as timber, oily rags, and so on.
- If necessary, the hot work site and its surroundings must be wetted with water or film foam applied
- Any holes in the structures must be protected and the surrounding premises inspected.
- If necessary, hot work guarding must also be provided in these premises.
- To prevent the spreading of sparks, non-flammable tarpaulins must be kept available at the site.
- The conduction of heat from hot work via pipes, ventilation ducts, and so on to other premises must be prevented.
- **The hot work site must have the emergency extinguishing equipment required by the hot work permit, but at least the equivalent of two 43A 183B C-rated hand extinguishers (at least two 6-kg extinguishers of this rating).**
- **In addition, there must be another corresponding hand extinguisher or two hand extinguishers corresponding to a 27A 144 B C-rated extinguisher (12 kg) in the immediate vicinity of the hot work site, not more than 10 meters away. One of these can be an extinguisher required for gas bottle carts. The hand extinguisher can be substituted by a hose reel pursuant to SFS – EN 671-1.**
- Fixed fire extinguishers placed in the departments and lines may not be used as hot work extinguishers; hot work workers must have separate fire extinguishers reserved for hot work.
- If necessary, the gas concentration of the work space must be measured and the work space ventilated.

- Hot work may not be commenced before all of the safety precautions required by the hot work permit have been implemented.
- If there is an automatic fire alarm at the site, it can be disconnected by a department shift manager employed by Outokumpu or a separately designated supervisor, and elsewhere by the supervisor of work.
- Disconnecting and connecting fire alarm systems at the Tornio plants must always be reported to the area control room at the main gate, tel. +358 16 45 2298
- Ensure that everyone working at the site knows the emergency number of the plant area and knows how to report an emergency and use the emergency extinguishing equipment required by the hot work permit.

6.4 Safety measures during work

- During hot work, it is ensured that the safety measures during work agreed upon in the hot work permit are implemented and that the fire risk of the working environment has not changed.
- IN PARTICULAR, it is ensured that flammable material that accumulates during work is collected and removed as it is generated.
- Emergency extinguishing equipment pursuant to the hot work permit must always be available at the hot work location.
- Hot work guarding required by the hot work permit is implemented throughout the duration of the work, including during breaks. A hot work operator cannot act as a hot work guard during work.
- One of a work pair can act as the hot work guard, and must be named. “Team” is not the name of a hot work guard.
- Note! The organization performing the work is always responsible for hot work guarding, unless otherwise agreed in the hot work permit. Persons responsible for hot work guarding must be assigned for the duration of the hot work guard’s breaks, and they must be specified separately in the hot work permit.
- The gas concentration of any flammable gases in the working area is measured and the area is ventilated, if necessary. There are concentration meters in the departments or at the area rescue center (fire station).
- Ensure the hot work permit is up to date in connection with changes of shifts, for example.

- Gas bottles should always be stored in an appropriate place, such as in gas bottle carts, racks or transport crates. Empty bottles must be placed in the storage crate.

6.5 Safety measures after work

- After the end of hot work, the fire watch must be continued for the duration specified in the hot work permit, with a minimum of two hours, requiring the continuous presence of a hot work guard or continuous supervision of the site.
- The hot work permit may outline a longer guarding period.
- Disconnected fire alarm systems must be reconnected immediately after the work is finished. Reconnecting the system is reported at the Tornio plants to the area control center at the main gate.
- The completion of work is reported to the hot work permit issuer.

6.6 Matters to be taken into account in roofing hot work

- In roofing hot work, waterproofing must not be fastened to cladding or metal structures in such a way that the fastening point is heated.
- Open flame or hot air must not be used closer than 1.5 meters from ventilation equipment openings or connection points of horizontal and vertical structures.
- **There must be two 43A 183B C-rated hand extinguishers and a 2" pressurized fire hose and clearing equipment for making a hole in the roof for extinguishing in case of a fire at a roofing hot work site.**

6.7 Spaces with an explosive hazard (ATEX atmospheres)

Explosive ATEX atmospheres include equipment/premises containing carbon monoxide, propane, natural gas or oil. Only those responsible for ATEX atmospheres can issue a hot work permit in the area of ATEX atmospheres. Moreover, the fire safety team of the central safety services must inspect the premises on-site before the commencement of work. In exceptional situations, such as a night shift, a hot work permit can be issued for the site by a qualified person designated in the explosion protection document (e.g. a shift supervisor who has received training and orientation).

If non-ex-protected electrical equipment, tools or methods that can cause sparks (e.g., a battery-powered drilling machine) are used in ex-rated areas, a hot work permit is required.

The locations of ATEX atmospheres, hazardous substances and dusts, as well as the persons responsible, can be found in the TTT system's explosion protection database.

7 Implementation of hot work guarding

This hot work supervision plan and related safety guidelines and appendices are followed at Outokumpu's Tornio plants and Kemi mine, and at other properties owned by the company (such as Itäranta 10, Ykskuusi, etc.), in all work included in hot work.

It is possible to carry out monitoring rounds related to temporary hot work sites, for example in connection with the SBO round.

8 Various areas in which hot work is performed

Safety precautions and matters that need to be specifically taken into account at temporary hot work sites are listed below.

Electrical premises
The operator must be inducted in the safe performance of electrical work. If necessary, a professional electrician must be present to render the hot work safe. Note! Hot work permits for the main conversion facilities (areas owned by Aurora) are issued by Aurora's officers.

Production premises
Hot work permits for the area may only be issued by the area's shift manager or a separately designated person.

Roofs (all buildings)
Both hot work and roofing and waterproofing hot work are performed on roofs.

Outdoor areas
If necessary, roofing and waterproofing hot work (e.g., bitumen work). Risk of wildfire in outdoor areas (lots of gas and chemical pipelines in the area).

Explosive ATEX areas
For additional information, see section 6.7.

HVAC ducts and pipelines
The accumulation of dust and the conduction of heat via pipelines must be taken into account in particular in the safety measures.

Shutdown sites
Hot work permits for shutdown sites may only be issued by the area's shift manager or a separately designated person.

9 Checklist for persons involved in hot work

A hot work permit is required for performing hot work; external service providers (contractors) are additionally required to have a work permit. Work permits are obtained from the person who ordered the work at Outokumpu or their authorized representative. Hot work permits are obtained from the shift manager employed by Outokumpu or a separately designated person.

When planning hot work:

1. Find out if alternative methods could be used (no sparks and no open flame).
2. If hot work cannot be avoided, the person responsible for hot work permits for the area is contacted. In the production department, the permit is issued by the area's shift manager or the area's separately designated person employed by Outokumpu.
3. Performing the investigation and assessment of site hazards together with the hot work operators and hot work guards is agreed with the hot work permit issuer.
4. The hot work site is reviewed and fire hazards are eliminated (cleaning and protection).
5. Review of the equipment and supplies needed for hot work and extinguishing equipment required for fire protection.
6. Disconnecting the fire alarms of the area is taken care of together with the hot work permit issuer.
7. Writing and approving the hot work permit (if necessary, extending the hot work permit when the issuer of the hot work permit changes in connection with shift changes).
8. Safe performance of hot work.
9. It is ensured that there is no unnecessary fire load at the hot work site.
10. A hot work end notification is submitted to the hot work permit issuer.
11. Hot work guarding is continued for a minimum of two (2) hours after the end of hot work.
12. Reconnecting the fire alarm systems is taken care of with the issuer of the hot work permit.
13. The team carrying out hot work ensures that the agreed safety requirements during the hot work are met and that the hot work site is clean.

10 Location of permanent hot work sites

10.1 Tornio plants

At the Tornio plants, permanent hot work sites or areas where a written hot work permit is not required are located in the following locations:

Permanent hot work sites of the ferrochrome plants:

- VKU 1: Shell extension, 4th floor.
- VKU 2: Shell extension, 4th floor.
- VKU 3: Permanent hot work site, 2nd floor
- VKU 3: Shell extension, 4th floor.
- Sintering plant: Ground level
- Repair shop: Workshop hot work sites door 575
- Ladle repair site: Door 511
- VKU 1, 2 and 3 casting hall and casting yard area
- Elimination of dosing malfunctions => use of blow torch

Permanent hot work sites of the steel smelting plant:

- Grinder HK6: Rock fitting place
- JVK2 Maintenance facility hot work site
- Maintenance facility hot work site, door 122
- Refractory installation hall 1, door E151
- Refractory installation hall 2, door 159

Permanent hot work sites of the hot rolling mill:

- Roll storage, door 209
- Roll collaring, door 208
- Maintenance hall hot work sites 2 pcs, door 207
- Electric workshop, 2nd floor, door 220

Permanent hot work sites of the cold rolling mills:

- Cold rolling mill 1: Maintenance facility hot work site
- Cold rolling mill 1: Electric workshop hot work room
- Cold rolling mill 2: Workshop hot work site

Permanent hot work sites of general areas:

- Vehicle maintenance, service hall and Caverion’s facility
- Central workshop, sheet hall
- Crane maintenance workshop
- Fire station, hot work room
- Port, workshop, Havator hall
- Research center, workshop hot work sites 1 and 2
- Water treatment plant, workshop hot work site
- Aurora office building's permanent hot work site

Hot work areas where a separate written hot work permit is not required for hot work, but the protection must be as at a temporary hot work site:

- An ordinary hot work location is a temporary work location in the hot rolling mill, steel smelting plant or outdoor areas that does not contain flammable materials, and hot work performed there does not cause a risk of ignition to its surroundings.
- The establishment of a new such site must always be considered on a case-by-case basis. If deviations from the hot work control plan are made, a separate risk assessment and work

instruction must be made in cooperation between the central safety organization and the responsible persons of the department that proposes the special permit.
- Sites that deviate from the hot work control plan at the Tornio plants:
    - In the Röyttä port area, defrosting of icy lines with a gas burner

10.2 Kemi mine

At the Kemi mine, permanent hot work sites are found in the following locations:

- sheet hall of the overground repair shop
- welding work area in the 115 maintenance area
- welding work area in the 350 maintenance area
- sheet hall in the 500 maintenance area

Hot work areas where a separate written hot work permit is not required for hot work, but the protection must be as at a temporary hot work site:

- An ordinary hot work location is a temporary work location in the open quarry, underground mine or outdoor areas that does not contain flammable materials, and hot work performed there does not cause a risk of ignition to its surroundings.
- The establishment/approval of a new such site must always be considered on a case-by-case basis. If deviations from the hot work control plan are made, a separate risk assessment and work instruction must be made in cooperation between the central safety organization and the responsible persons of the department that proposes the special permit. In addition, the sites must be recorded in the hot work control plan:
    - In the underground mine, straightening/shaping the wire end of the wiring machine (TKaKaiv 212 Wire bolting).

11 Action in the event of an accident

In the event of an accident, the area's internal rescue guidelines are followed by alerting the area's firefighting and rescue team.

Additional information about action in an accident situation can be found in the internal rescue plan.

Further information on hot work matters can be obtained from the department's fire and safety officers and from the central safety organization.