

WORK ON MASTS AND TOWERS

Ref.: Provisions of the Swedish National Board of Occupational Safety and Health, AFS 2000:6 Mast and pole work

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1 Definitions

- * **External personnel** = Individuals who are not employed by Teracom AB.
- * **Mast** = antenna carrier made of steel, wood or concrete with a vertical drop of more than 13 m. This should also include chimneys and permanently installed ladders without fall protection or back protection loops.
- * **Coordination manager** = the person at the workplace who is responsible on Teracom's behalf for the shared working environment.
- * **Manager** = the person who has the authority to direct personnel, as well as to decide which working methods and working aids are to be used for a particular job. He must also fulfill the employer's obligations.
- * **Supervisor** = the person who has been directed to manage and allocate the work at the workplace.
- * **Risk zone around ice-covered mast** = The area around the mast where ice can fall. This must be marked with permanent warning signs. The size of the risk zone is normally a circular area around the mast with a radius of 2/3 the height of the mast.
- * **Risk zone during mast work** = A circular area around the mast with a radius of 2/3 the height of the workplace on the mast.
- * **Manual de-icing** = when personnel manually remove ice from the actual mast structure using hand-tools (to reduce the load on the mast) while they are on the mast.

2 Validity

This regulation makes no claim to cover all different situations regarding work at height, as this area is so wide-ranging and constantly changing. Individual assessments may therefore need to be made on a case-by-case basis.

The regulation applies to Teracom's personnel and external personnel under Teracom's supervision when working or spending time on masts, and where applicable during work that is carried out within masts' risk zone.

When agreements are entered into with external companies who, on our behalf or in accordance with agreements, have work duties that entail the necessity to climb masts, we must provide information regarding which internal safety provisions are to apply, over and above nationally applicable provisions. In the event of written business arrangements, this must be written into the agreement. See also Sköldpaddan Coordination responsibility/ZAM 66.



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The following internal regulations also apply when working on masts.

WORKING ENVIRONMENT; /ZAM 66	Checking protective equipment
WORKING ENVIRONMENT; /ZAM 66	Use of helicopters
WORKING ENVIRONMENT; /ZAM 66	Bosun's chair
WORKING ENVIRONMENT; /ZAM 66	Spending time at masts and towers
WORKING ENVIRONMENT; /ZAM 66	Procedure for height certificate
WORKING ENVIRONMENT; /ZAM 66	High-frequency electromagnetic fields
WORKING ENVIRONMENT; /ZAM 66	Rescue equipment
XAT 100 045	Equipment for lifting goods

3 Responsibility

Teracom is responsible for the coordination of working environment issues within the station area, unless otherwise agreed in writing. The coordination manager is entitled to stop the work in the event of failure to comply with the safety regulations for the station.

Teracom accepts no responsibility nor any obligations in relation to personnel employed by the contracting company or contractual partners, over and above that agreed in writing. All personnel, including contractors, customers, etc., who for one reason or another need to spend time on Teracom's masts, must have a valid height certificate and must use the prescribed protective equipment.

Work that requires direct management and coordination of activities must be carried out in the presence of the individual's immediate superior. Routine work may be carried out under the management of a supervisor who has received verbal or written instructions.

The supervisor must ensure that applicable regulations, directions and instructions are complied with, that the work is conducted in a safe manner, and that approved methods, suitable tools and implements are used.

4 Authorization - training

In order to be able to work or spend time on masts, authorization is required in the form of a height certificate. If a mast lift is to be used, the operator must receive training from Teracom relating to the type of mast lift in question. This can be obtained in accordance with established procedures. See /ZAM 66 Procedure for height certificate.



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5 Planning the work

Anyone who considers himself temporarily unsuitable (physically or mentally) for mast work may not work or spend time on a mast.

The work must be planned in advance and coordinated with other activities at the station/transmission site and within the risk zone. Agreement regarding imminent work must therefore be reached as early as possible with the personnel at the facility. The same applies to any work that requires the transmitter to be completely disconnected, or for transmission to take place at reduced power.

6 Protective and rescue equipment

Protective equipment must be checked before and after each use, and may not be used for other purposes. Defective equipment must be destroyed and replaced with fault-free equipment.

6.1 Mandatory protective equipment

Safety harness CE tested in accordance with EN 361 and a type-approved by Teracom. See Recommended personal protective equipment/ZAM66.

Lanyard x 2, CE tested in accordance with EN 358. They must have safety hooks with double locks. See Recommended personal protective equipment/ZAM66.

The lanyard must be connected and adjusted in such a way that the fall height in the event of a fall is limited to a maximum of 0.5 m.

Safety line for roof work CE tested in accordance with EN 358. See /ZAM66. Recommended personal protective equipment

Protective helmet CE tested in accordance with EN 397. Motorist helmets may be used when transport to the installation has taken place in an off-road vehicle. Motorist helmets with built-in communication systems may also be used when this is deemed to be appropriate. See Recommended personal protective equipment/ZAM66.

Footwear Leather boots/shoes CE tested in accordance with EN 345. Protective shoes with nail penetration protection are recommended. See Recommended personal protective equipment/ZAM66.

Gloves Ideally with leather on the inside.

The mandatory protective equipment must be also be brought along when traveling in a mast lift.

The safety harness and lanyards must be checked at least once every 12 months, and this must be reported. They must also be supplied with a valid



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marking. The checks are carried out by an authorized person in accordance with the established procedure. See Checking protective equipment/ZAM 66.

6.2 Other protective equipment

Clothing Suitable clothing depending on the nature of the work and the time of the year.

Safety goggles Lattice model or other suitable type.

Individuals who constantly or frequently work on masts must possess this equipment personally.

6.3 Climbing ladder/Fall protection

Climbing must normally take place using a climbing ladder. If the ladder does not have back protection or if climbing takes place outside of the ladder, two lanyards must be used in such a way that at least one lanyard is always connected to the load-bearing structure. In certain cases, the two lanyards can be replaced with a mobile fall arrester. If permanently installed fall protection is present, this must be used! The fall protection must be CE tested in accordance with EN 363 or be examined and approved by Teracom. All personnel who may need to go up on the mast must have their own shuttle. Fall protection must be connected to a high connection point on the harness.

Fall protection must be examined before and after each use. Checks must be performed annually, the same as checks on safety harnesses and safety lines.

6.4 Rescue equipment

On some tall masts there is a telephone in the mast cab. This can be used to call for assistance in an emergency. As not all mast cabs have a telephone, it is necessary for personnel spending time on the mast to have their own cell phone with them.

Personnel working or spending time on the mast must be well acquainted with how the rescue equipment is to be used. Training exercises must be carried out every other year. During practical exercises, a mobile fall arrester must be used. Exercises must not take place using the rescue equipment. The sack must be taken along in the lift when this is used. During other work, the sack must be placed in the vicinity of the mast, ideally stored in a plastic crate so that it is not exposed to the wind and weather.

External personnel must have their own rescue equipment when working on masts.

When personnel are to spend time in the square spire, special emergency tools must be taken along to the bottom of the spire. **Only experienced personnel may spend time in the spire.** The emergency tools must comprise at least one small angle cutter, a mobile residual current device, an extension cord that is sufficiently long that the whole spire can be reached, and a spare cutting disc including the necessary tools for its replacement. The cutting discs must be intended for stainless steel plate.

7 Signs

When spending time on masts, or when such work is taking place that the risk of falling objects cannot be eliminated, a sign stating “**MAST WORK IN PROGRESS, RISK OF FALLING OBJECTS**” must be erected at the boundary of the risk zone and in other locations where outside individuals could possibly enter the risk zone.



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With regard to signs in the event of high electromagnetic fields, see under point 8.7.

8 Working on masts

8.1 General

Work on masts may not be carried out by individuals working alone. If the work duty on the mast does not require more than one person, an employee on the ground adjacent to the facility (although not indoors) must be constantly prepared to provide relief. The employee must therefore be authorized and be wearing protective equipment for mast work. In the event of work on a high mast where the mast lift is used, at least two people must go up together.

The work must be arranged in such a way that visual or voice contact can always be maintained. The vertical distance between the individuals must not be so great that the “assistant” cannot reach the person in need within 10 minutes.

Tools and equipment must be stored in a secure location. Where possible, hand-tools must be secured to the safety harness. Items that cannot be attached securely must not be left behind at the end of a shift or a particular job.

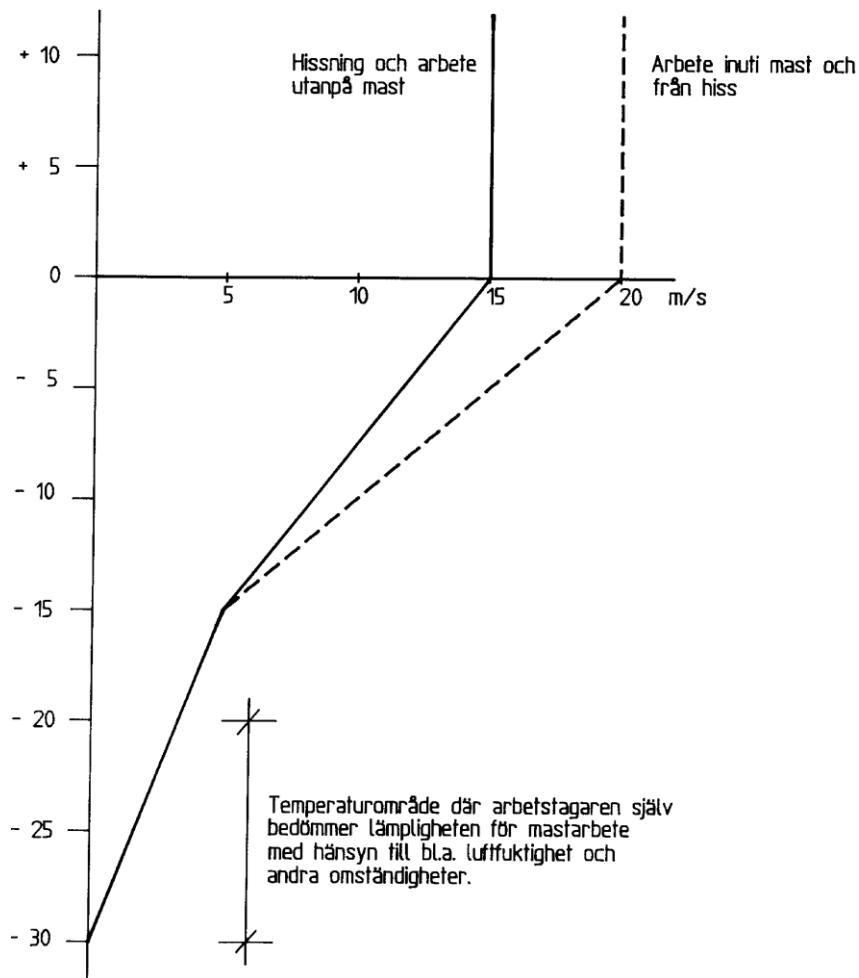
Work at various levels may only take place on the condition that the higher workplace(s) cannot entail a risk of injury to personnel below.

8.2 Working in wind and cold conditions

The recommended minimum temperatures for spending time on a mast at various wind strengths are specified below.



Rekommenderade lägsta värden på temperatur för
arbete i mast med olika vindstyrkor



8.3 Working in thunderstorms

Working during thunderstorms is not permitted. Personnel must leave the mast as soon as possible in the event of an impending thunderstorm. If there is not time for this, personnel must move to the mast cab or another location that is enclosed by the mast structure. The lanyard must always be connected to the mast in the latter case.

8.4 Working in the dark

Working in the dark should be avoided. If work has to be carried out, it may only be executed by personnel who are well acquainted with the particular work duty in question.

Lifting operations may not be carried out if personnel do not have full control over the load's route.

A head lamp can constitute suitable lighting. For personnel working inside the square spire, a head lamp is compulsory. If temporarily installed local lighting with 230 V mains voltage is used, the lighting must be connected via



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a residual current device. The light fitting must be of such a type and must be installed in such a way that it causes minimal dazzling. It has been shown that yellow safety goggles significantly reduce the risk of dazzling.

8.5 Working on an ice-covered mast

Personnel may not remain on the mast when there is an unacceptable risk of snow or ice falling or when the visibility conditions mean that the work cannot be carried out safely.

The mast lift must not be used in such conditions. If the climbing ladder is unusable as an emergency route, the lift must not be used either.

In such conditions, manual de-icing may not be carried out by people who are on the mast. The removal of small amounts of ice in order to set up equipment is permitted if this is performed under safe conditions.

If there is any doubt, contact the responsible service manager (or a replacement appointed by this person), who may then determine how and whether the work can be carried out. Feel free to use MMS picture messages to help provide individuals who are not on site with a basis for taking the right decisions.

8.6 Electric tools

When used in the mast, electric tools connected to the mains must be connected via a residual current device. The user must always be secured with a safety line, even when working on e.g. a balcony.

8.7 HF fields/Disconnection of transmitter

Personnel may only spend time in or pass through areas with high-frequency electromagnetic fields if the power flux density does not exceed permitted values. Information about where the values are too high must be available so that mast personnel have access to this at the workplace.

Transmitters that have been disconnected or transmitters with reduced output due to mast work must be fitted with a sign: **“Must not be operated. Work in progress!”**. Anyone who intends to remove this sign must himself check with mast personnel that the mast work on the transmitter antenna has been completed before the sign may be removed.

The potential for remote operation of the transmitter must be blocked.

If a person has been, or is suspected of having been, exposed to a high electromagnetic field, this must be notified immediately to the person’s superior. The superior will then decide on further action, after consultation with the environmental officer and the safety representative.

8.8 Operating mast lifts in masts with fall protection rail

When using a mast lift in a mast with a fall protection rail, all those who are travelling in the lift and/or working on the mast must have a shuttle for use on the fall protection rail. When operating the lift at the same time as people are in the climbing rail, particular attention must be paid to ensure that “meetings” can take place without the climber mistakenly becoming caught in the lift. If possible,



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communication should take place between the lift operator and the climber via a comms radio.

9 Lifting goods

The work must be conducted in such a way that personnel at the station are not exposed to the risk of injuries. The work must also be organized such that the risk of damage to the station building and other adjacent structures is minimized.

Before lifting, an assessment must always be carried out as to whether lifting can be performed safely. In particular, attention must be given to the effects of wind drift as well as the consequences in the event of the load coming loose.

A bracing line should normally be used to avoid the goods catching in the mast structure.

If possible, the lifting of heaving goods should take place in the sector situated furthest away from the station building, i.e. in the opposite direction from the guy that passes over the building.

In those cases where the station building or its safety areas cannot be deemed to provide secure protection against falling goods, the station must be temporarily evacuated during lifting.

During lifting, hoists must be positioned so that the operator has a good view of the entire lift and so that he is not at risk of being injured in the event of the load coming loose.

Hoists and winches, as well as mast and guys, must be grounded to the same ground system.

In order to avoid operational disruptions, lines must be anchored and grounded to the mast at the end of the working day.

Voice communication should be available between the hoist operator and fitters.

The foreman or supervisor must ensure that the lifting device and fixed equipment belonging to the device are properly inspected, and that they are assembled, used and stored correctly. He must also ensure the ongoing inspections and maintenance are performed and reported.

