5. HARVESTING OPERATIONS

5.1 Safety in harvesting operations

5.1.1 Principles

Work in damaged forests is more hazardous than normal due to increased frequency of dangerous situations, new types of dangerous situations, temporarily higher workload in individual work elements, fatigue at the end of the workshift, and time pressure. Even without an increase in the accident rate the total number of accidents is likely to rise as a result of the increased number of workers in the area.

Accidents can never be ruled out
but working conditions and working techniques
can be made safer

Safety in forest work is not simply a matter of using correct work practice or protective clothing. Safety must be an integral part of the whole operation.

Safer work requires well defined working methods and organisation, and adequate tools and equipment. New and innovative methods and techniques are often introduced. Special safety regulations must be implemented because of the specific risks involved in harvesting damaged forests (see Appendices 5).

This involves identifying the risks and developing well defined working methods which minimise these risks. Training must be given in the correct techniques and suitable equipment and protective clothing must be used. While the aim is to prevent accidents happening arrangements should also be made for dealing with accidents if they should happen.

5.1.2 Accident risks in wood harvesting

Accident risks vary with the type of damage. Table 1 lists the most common causes of forest damage and indicates its possible effects on the trees.

Tab. 1: The most common causes of damage and possible effects on the trees:

Cause of damage	Effect				
	Dead, standing trees	Broken, snappedt rees	Leaning, bent trees	Uprooted trees	Entangeled trees
High winds		XX	XX	XX	X
Fire	XX	X	X	X	
Insect attacks	X		X	X	
Snow/ice in crowns					X
Flooding, still water					
Flooding, running water					X

Summarised below are the potential dangers in harvesting damaged stands as indicated.

Dead standing trees

Felling requires special attention. Rotten tops and branches are extremely hazardous and must be watched constantly. If the butt end is rotten directional felling may be difficult or impossible. Felling is also difficult because dry trees sometimes do not fall easily.

Snapped-off or broken trees

Trees with broken tops or branches must be carefully checked for loose debris which may come off when work begins.

Partially broken trees with the top still attached to the stem and touching the ground may be felled sideways. Otherwise use should be made of a winch to assist the tree feller.

When felling stems without crowns directional felling is more difficult. When cut off they fall rapidly and when they hit the ground they may bounce violently and in steep terrain may roll or slide downhill.

Leaning or bent trees

Trees are often under heavy tension which requires special cutting techniques to avoid splitting the stem or risk to operators when the tension is released.

Up-rooted trees

Trees are usually under tension or compression, which must be carefully released during cutting while the operator assesses the likely movement of the tree and stands in a safe position. Multi-stem root-plates makes it even more difficult.

Where root plates might fall after severing of the log they should be made secure.

Entangled trees

Working conditions are difficult and hazardous and accessibility impeded. Stems and branches in tension make delimbing and cross-cutting difficult and it is strongly recommended that this is done after pulling the trees to an unobstructed space.

Often there is a combination of risks which makes the work even more hazardous

The site itself may cause further difficulties, eg trees covered with ice and snow or damage occurring on recreation sites, in parks, on hunting grounds etc. Trees which have grown freestanding or were over-mature are difficult due to large size, coarse branches, and rotten butts and branches.

Safe working methods for dealing with the more common problems have been developed and in many countries leaflets are available for distribution to operators (see Appendices 5). These must not be a substitute for but should be supplemented with appropriate training.

5.1.3 Training

Only full qualified forestry workers (including machine operators) should participate in salvaging operations. Formal basic training of forest workers should fully cover logging in damaged forests (see Appendices 5, Syllabus). Where on-the-job training is used, it should be included only after trainees master the basic training. Regular up-dating training should be given. Atleast once every third year is recommended.

Experience indicates that the number of trainees should not exceed 6 in each group to achieve efficient training.

On-site refresher training

When acute forest damage has occurred the qualified forest worker should be given on-site refresher training. This should, if possible, be in representative stands which may also be used as models for work organisation and productivity. One day (morning theory, afternoon practice) may be sufficient for refresher training.

In emergency situations it is often necessary to recruit additional workers who may be employed directly or through contractors. Such workers should have received introductory training and shown that they are able to work safely on the jobs assigned to them.

Supervisors and team leaders are key people.
It is essential that they have an awareness and knowledge of safety matters.

Supervisors/team leaders must ensure that safe methods and equipment are used. They need basic training in safe methods and techniques and should also receive refresher training when involved in large salvaging operations.

Major forest enterprises often have their own instructors to run up-dating and refresher courses. It is important that they themselves are up-to-date on work in damaged areas. This may be done through assignments outside their own company if they assist elsewhere in salvaging operations.

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When it is necessary to reach a large number of workers within a short time, instructors may have to be transferred from other activities or recruited from other areas. The skill and ability to teach as well as knowledge in harvesting damaged forests are essential.

Up-to-date material for work organisation, working methods and design of courses should be available on request at the national training institutions concerned (see information provided by Government).

When salvaging operations start, the working teams should, if possible, remain as before damage but changed methods and production requirements can lead to differences in grouping.

To encourage co-operation among the workers and reduce the temptation to take risks for higher income, there may be a case for work to be paid on a time basis instead of piece rate or a change in the wage system toward a larger proportion of fixed wage. If the programme is sufficient then specific standard timetables should be prepared.

5.1.4 Clothing and other personal protective equipment

In most countries there are regulations on the use of personal protective equipment and clothing in timber harvesting, (see Appendices 5). Some, if not most, of the items concerned are provided or subsidised by the employer. In harvesting operations it is extremely important that such personal protective equipment is available, in good order and is used. This should be ensured through checks before the operation starts.

Chainsaw operators require the following personal protective equipment:

- helmet;
- visor;
- ear muffs;
- protective gloves;
- trousers, leggings with sewn in protection;
- forestry boots with built in chainsaw protection.

National Forest Authorities will often issue more detailed guidance.

In order to be seen easily the helmet should be bright coloured, a working jacket/blouse with bright orange yoke (or other signalling colour) is often compulsory.

In case of accident each worker should carry his own personal first aid kit (see following sub-chapter).

In some countries standards exist for the above protective clothing. The surest way to be certain about the products protective capacity is to ascertain to which standard it has been tested (eg Swedish SMT and German KWF). The International Standard Organisation (ISO) is working on a standard to be introduced in the near future. Some garments have labels sewn inside saying they conform to certain standards.

A combination of an ear-mike and two-way radio, attached to the helmet has been developed. This allows reception and transmission when the operator is wearing protective headgear and earmuffs, leaving his hands free. The equipment is useful eg when oral communication between workers or between workers and machine operators is needed.

5.1.5 First aid

Accidents cannot be completely ruled out and therefore provisions must be made for first aid.

First aid comprises:

- The identification of the injury and assessment of its severity.
- Necessary first treatment of the injury on the spot.
- The call for further assistance including transport and medical facilities, if necessary.

First aid kits should be available at every work site

The contents of the kit are often regulated by law. Appendix the typical contents of first aid kits suitable for working teams of up to 10 persons. A second kit will be required for any additional personnel up to 50.

The supplies need to be regularly checked and replenished. A stretcher with 2 blankets may be recommended on large work sites. Drugs should be forbidden and medication should be avoided since they make later treatment more difficult.

Personal first aid kits should be carried by individuals. These should contain:

- individually wrapped sterile adhesive dressings;
- 2 antiseptic wipes;
- 1 large wound dressing.

All workers should be given refresher instructions on first aid in the context of introductory training before starting work in damaged areas (see Appendix 5, Syllabus).

In addition a trained first aid assistant may be employed when large groups of workers are working in isolated places. He should be a member of the working team and be trained to give first aid and call for medical care (see Appendix 5, Syllabus).

Such training should be provided to persons who are motivated by this kind of work and have the ability to make decisions. Other valuable characteristics are reliability, emotional stability and ability to cope with human beings in a crisis situation.

Training in first aid should be given by someone with medical experience of the types of accident occurring in forest work or from a first aid organisation.

5.1.6 Emergency calls

The need for emergency transport of an injured person must always be anticipated. The employer must have a system and plans for calling for assistance. The equipment upon which the system depends should be tested at each new work site, to ensure transmission and clear communication between users. If individual workers are performing their tasks at a distance from each other, they should be equipped with individual emergency transmitters to cover the first link of communication in case of accident.

Clear and ambiguous instructions to use the communication equipment are essential.

A procedure should be established to avoid delays, confusion and unnecessary duplication of emergency information

A list of emergency telephone numbers should be available at the headquarters, and by the work place.

Note, some countries have telephone numbers of emergency centres to be used in the first instance!

In Appendices 5 are examples of useful information when calling for medical help and a pro forma for emergency telephone numbers.

If logging operations are carried out in areas with poor road conditions, plans for assistance by other means of transport should be made eg helicopter.

A map depicting the salvaging area should be prepared with the work sites clearly indicated and named. The map should be regularly updated and distributed to those on the list primarily concerned. Access roads should be marked and if necessary meeting places shall be predetermined and clearly indicated.

The National Authority is able to give necessary information and also authorise which frequencies to use for emergencies. Ensure a frequency without interference from other communication.

Local radio amateurs may be of great help regarding equipment and regional advice.