ELA

Your guidelines to SNEL
(Safety Norm for Existing Lifts)

Improving safety and accessibility of existing lifts in Europe

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THE PRESENT GUIDELINES ARE INTENDED AS A TOOL AMONG OTHERS TO HELP IN ASSESSING THE SAFETY OF EXISTING LIFTS UNDER SNEL. IT IS NOT INTENDED AS A SUBSTITUTE FOR EACH LIFT OWNER'S OR LIFT TECHNICIAN'S OWN ASSESSMENT AND DECISION-MAKING REGARDING ACCEPTABLE LEVELS OF SAFETY AND MEASURES TO BE TAKEN TO IMPROVE THE SAFETY OF AN EXISTING INSTALLATION. ELA DECLINES ANY AND ALL LIABILITY FOR ANY MEASURE TAKEN OR NOT TAKEN ON THE BASIS OF THE PRESENT GUIDELINES

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1 GENERAL INTRODUCTION TO SNEL

Three million lifts are in use today in Europe. In many countries, more than half of existing elevators are 25 years old or older. Few of them have been modernised to meet current safety and performance requirements.
Nevertheless ageing elevators can be made more effective, safer, more reliable and more comfortable through regular maintenance and improvement.

1.1 Safety and accessibility of existing lifts

The community of the travelling public appreciates the mobility and access that lifts, escalators and moving walks provide to all groups in the community. They also expect that their journeys are as safe as possible.
There is a need for new technical and social solutions to facilitate everyday life and to create an inclusive society. These solutions will have an impact on all residents of urban societies and on people in their environments, be they young or old, healthy or with restricted mobility. Home owners and builders are in a key position to provide the necessary infrastructure. Vertical lift equipment and related services are an integral part of the accessibility chain of buildings and of society as a whole.

There is a growing trend in our population: people live longer. The disabled require access and both groups, senior citizens and people with disabilities want safety without the need for supervision. People do not want to leave their homes where they have been living for many years due to age and mobility problems.

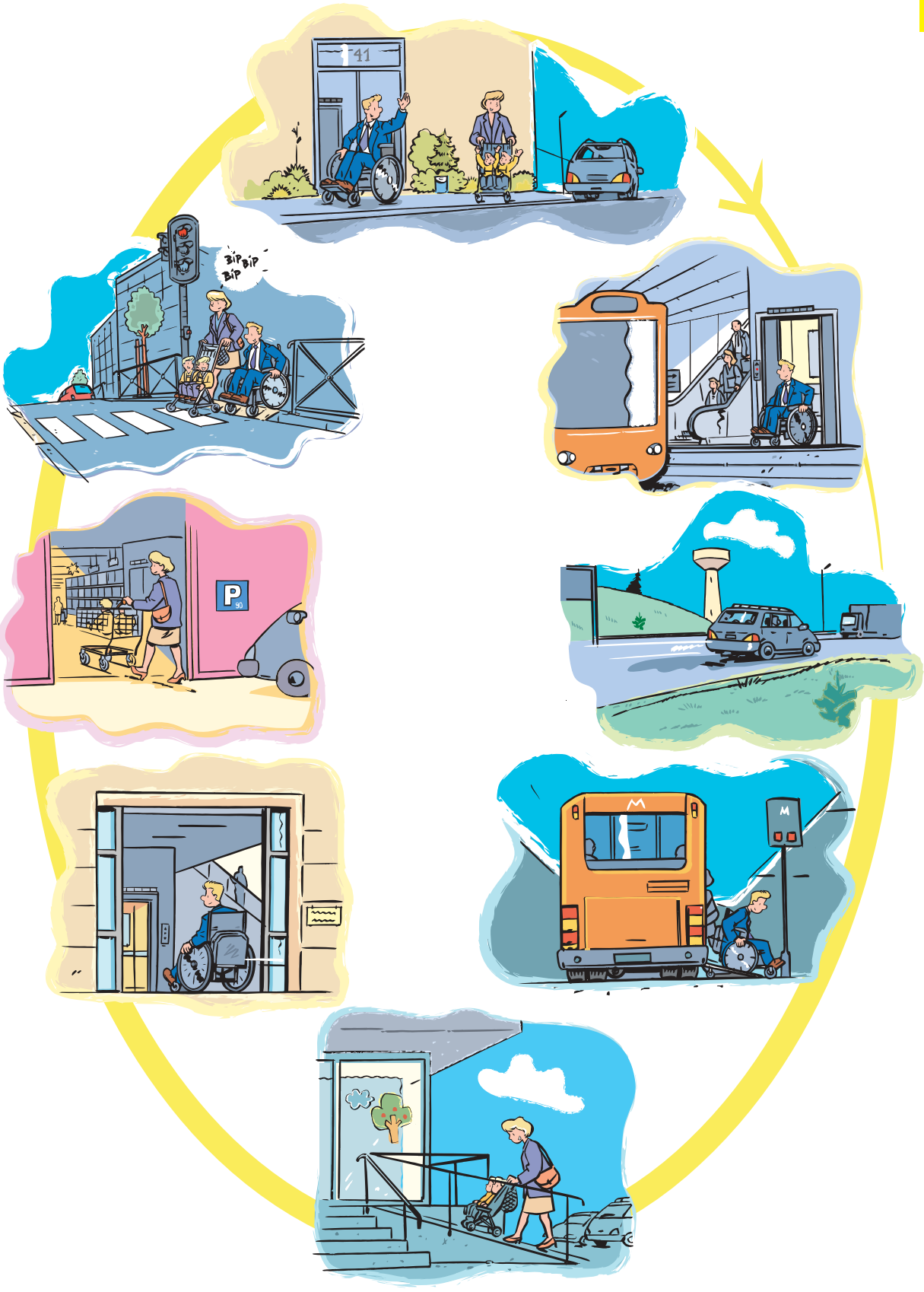
Finally, lift attendants and caretakers are less common and therefore it is necessary to provide relevant safety features for the rescue of trapped persons.

Today, the European Committee of Standardization (CEN) has added to its well-known European Standard for new lifts, EN 81 part 1 and 2, a key standard for the safety of existing lifts, EN 81-80. This new standard is the result of several years work by committed safety experts from lift industry, authorities, third party inspection bodies, consumers organisations and insurance companies.

EN 81-80, *Safety rules for the construction and installation of lifts – Existing lifts* – Part 80: *Rules for the improvement of safety of existing passenger and goods passenger lifts,* categorises various hazards and hazardous situations, each of which has been analysed by a risk assessment. It then provides a list of corrective actions to improve safety progressively.

The lift should be audited against a checklist of more than 70 items.
The identification of the hazardous situation can be carried out in the course of any periodical survey or special examination on a given installation, but only technically competent and sufficiently trained persons should be allowed to carry out these examinations. This can be subjected to national regulations.

The Mobility Chain



Once the weak points of the installation have been identified through this pro-active assessment or safety audit, improvements can be made (if necessary) by a stepwise upgrading which can naturally be combined with any modernisation being carried out. In addition, preventive maintenance and repairs are a necessary ongoing process.

We understand under:

- Preventive maintenance and inspection:
  "All the necessary operations to ensure the safe and intended functioning of the installation and its components after the completion of the installation and throughout its life cycle.
  Furthermore it is about the need for the owner, the maintenance organisation and third party inspection body to undertake appropriate measures in case of detection of any dangerous situations."

- Repairs:
  "Is about the replacement of faulty components by equally safe or safer components/parts corresponding to today state-of-the-art."

- Modernisation:
  "Is about the technical upgrading of the installation changing the main characteristics or upgrading (Not listed in order of importance):
  - Safety
  - Accessibility
  - Availability
  - Performance
  - Reliability
  - Maintainability
  - Fulfilment of legal requirements and responsibilities
  - Increase of real-estate value
  - .... "

For more detailed information regarding the maintenance and inspection, please consult:
EN 13015: (2001) "Maintenance for lifts and escalators- rules for maintenance instructions"
EN 13306: (2001) "Maintenance terminology"

1.2 EN 81-80, "SNEL", a new standard with a great future:

SNEL (Safety Norm for Existing Lifts) is a powerful instrument that will soon show its impact all over Europe and through this will also serve as a benchmark for other countries outside Europe.

SNEL has to be applied as a technical guide package, to promote the progressive (when?) and selective (what?) maintaining and/or improvement of the safety of existing lifts.
Through these actions there will be an increase in the European lift safety and

accessibility for lift users, lift workers and third party inspectors.

Member states decision makers, lift owners, the lift industry and third party inspection bodies have a vital interest to understand the implications of SNEL. They must link up with closely related EU and National existing regulations.

The core message is to implement SNEL in a pro-active way. This allows the application of the well-known prevention principle, of taking the necessary and sufficient measures to ensure a safe situation.
This "SNEL" approach, once integrated and well applied, will finally make the lifts safer for all of us.

The creation, at member-state level, of a specific national law or decree, referring to or based upon this EN 81-80 standard, can give a more mandatory character to it, as this is already the case in Belgium, the Netherlands, in France and soon in Spain and Germany.

Even existing national legislation, based on the transposition of existing European directives and recommendations can help achieve this higher implementation level. The most important are:

- The "10" Recommendations (95/216/EC)
- The use of work equipment directive (UWED, 89/655/EC amended by 95/63/EC and 2001/45/EC)
- The product liability directive (85/374/EC of July 25, 1985)
- The product safety directive for the consumers (2001/95/EC of December 3, 2001)
- The directive 89/391/EC of June 12, 1989 on the introduction of measures to encourage improvements in the safety and health of workers at work

The implementation of EN 81-80 in each country, including the 74 defined risks, will vary in content and scheduling, to allow for any local differences in the assessment of those risks.

The definition of risks levels, categorised as extreme, high, medium or low, will depend on previous country history of lift regulations and applied standards, accident statistics, specific product knowledge and social expectations.

In SNEL, annex A, the described methodology of **"National Filtering Method"** provides a tool for easily and successfully defining the **when** and **what** status of each predefined SNEL risk.
Today, this filtering process, which is already applied in Belgium, the Netherlands and France, is also ongoing in other EU member-states such as Italy, Germany, Austria, ...

2 WHAT IS SNEL, WHAT IS SNEL NOT?

2.1 Introduction

Being ratified by CEN, the EN81-80, is now published (December 2003).
The implementation date as "European state of the art document" in the different EU member states is June 30, 2004.

SNEL is not:

This standard does not have an EU mandate related to a European Economic Directive (e.g. the Lift directive 95/16/EC), since it concerns existing installations only. Therefore this standard has not been published as a harmonised EU Standard.

Furthermore this is a safety standard and is not to be considered as a European modernisation standard for existing lifts!

SNEL is:

Despite its non-harmonised status, it is to be considered as equally important as other existing EN-standards for lifts.

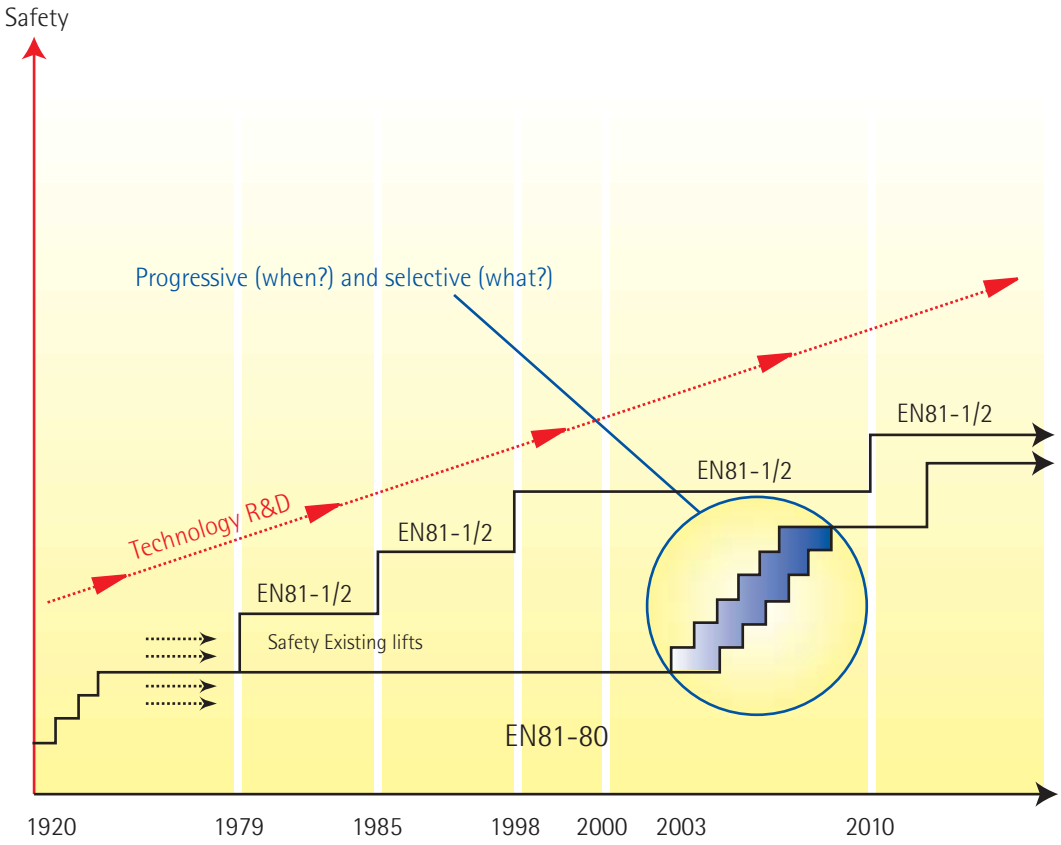
In summary:

- As a CEN ratified EN standard it must replace existing national standards related to the same topic.
- It is being made available to each National Standardization Organisation, after adequate translation in the applicable national language(s).
- It is to be considered as the "official state-of-the-art safety document for existing lifts" in Europe.

Furthermore this standard is not about modernisation, but about the progressive and selective improvement of the safety and accessibility of existing lifts.

Evolution of "the state of the art"

Step by step *safety improvement* of existing lifts



2.2 Approach of this standard

This standard:

- categorises various hazards and hazardous situations (# 74 scenarios), each of which has been analysed by a risk assessment;
- lists the extreme, high, medium and low risks and corrective actions which can be applied in separate steps in order to eliminate the risks;
- is intended to provide corrective actions to progressively and selectively improve, step by step, the safety of all existing passenger and goods passenger lifts towards today's state of the art for safety;
- provides a methodology for National Filtering to result in an audit method for each lift;
- enables each lift to be audited and safety measures to be identified and implemented in a step by step and selective fashion according to the frequency and severity of any single risk.

2.3 Use of this standard

This standard can be used as a guideline for:

- national authorities to determine their own programme of implementation in a step by step process via a filtering method (as further explained under point 3.1) in a reasonable and feasible way based on the level of risk (e.g. extreme, high, medium, low) and social and economic considerations;
- owners to follow their responsibilities according to existing regulations (e.g. Use of Work Equipment Directive);
- maintenance companies and/or inspection bodies to inform the owners on the safety level of their installations;
- owners to improve the safety of existing lifts on a voluntary basis in accordance with this standard if no regulations exist.

2.4 Other references in this standard

SNEL is also referring to other relevant EN 81 series of lift standards* such as:

- EN 81-1:1998, *Safety rules for the construction and installation of lifts - Part 1: Electric lifts.*
- EN 81- 2:1998, *Safety rules for the construction and installation of lifts - Part 2: Hydraulic lifts.*
- PrEN 81-21, *Safety rules for the construction and installation of lifts - Lifts for the transport of persons and goods - Part 21: New passenger and goods lifts in existing buildings.*
- EN 81-28, *Safety rules for the construction and installation of lifts - Lifts for the transport of persons and goods - Part 28: Remote alarm on passenger and goods passenger lifts.*
- EN 81-70:2003, *Safety rules for the construction and installations of lifts - Particular applications for passenger and good passenger lifts - Part 70: Accessibility to lifts for persons including persons with disability.*
- EN 13015,2001, *Maintenance for lifts and escalators, rules for maintenance instructions*
- PrEN 81-71, *Safety rules for the construction and installation of lifts - Particular applications to passenger lifts and goods passenger lifts - Part 71: Vandal resistant lifts.*
- PrEN 81-73, *Safety rules for the construction and installation of lifts - Particular applications for passenger and goods passenger lifts - Part 73: Behaviour of lifts in the event of fire.*

** The texts of these standards can be obtained from your national standardisation organisation.*

3 GUIDELINES FOR THE IMPLEMENTATION OF SNEL

3.1 National Filtering method

This is an essential part of the SNEL standard. It has to be well understood. Each member state applies SNEL in its own way by using the national filtering method.

All technical solutions for improvement of existing lifts to the state-of-the-art are listed in clause 5 of the EN 81-80 (see also point 3.3.1 and 3.3.6 of this document). Although immediate upgrading of all existing lifts to the state-of-the-art would be sensible from the safety point of view, this may not be possible in a short period of time, mainly for economic reasons.
This European Standard does not lay down binding requirements for measures to be carried out on lifts. Such obligations for existing lifts are subject to national legislation. The procedures described in annex A of the standard are intended to assist in setting up national regulations for increasing the safety of existing lifts by showing how to identify and evaluate the existing hazardous situations and how to classify priority levels which apply to the necessary hazard and risk reduction measures.
Indeed the implementation of EN 81-80 may vary in content and scheduling for each country, to allow for any local differences in the assessment of those risks.
The definition of risks levels, categorised as extreme, high, medium or low, will depend on previous country history of lift regulations and applied standards, accident statistics, specific product knowledge and social expectations.

3.2 The risk assessment philosophy

3.2.1 Introduction:

The EN 81-80 includes a list of hazards (#74), and is also describing the solutions to eliminate or reduce the risk.
Those risks have been identified and solutions have been selected, applying a risk analysis procedure.
Risk assessments are often based on the EN 1050 and ISO/TS 14798

- EN 1050:1996
  Safety of machinery – principles for risk assessment

- ISO/TS 14798
  Lifts, escalators and passenger conveyors - Risk analysis- Methodology
  part 1: General

For a better understanding of the way the EN 81-80 European experts listed the 74 identified risks and corresponding solutions, it is essential to understand the basics of a risk analysis.
Knowledge of the basic rules of the way to make a risk analysis can be very helpful in

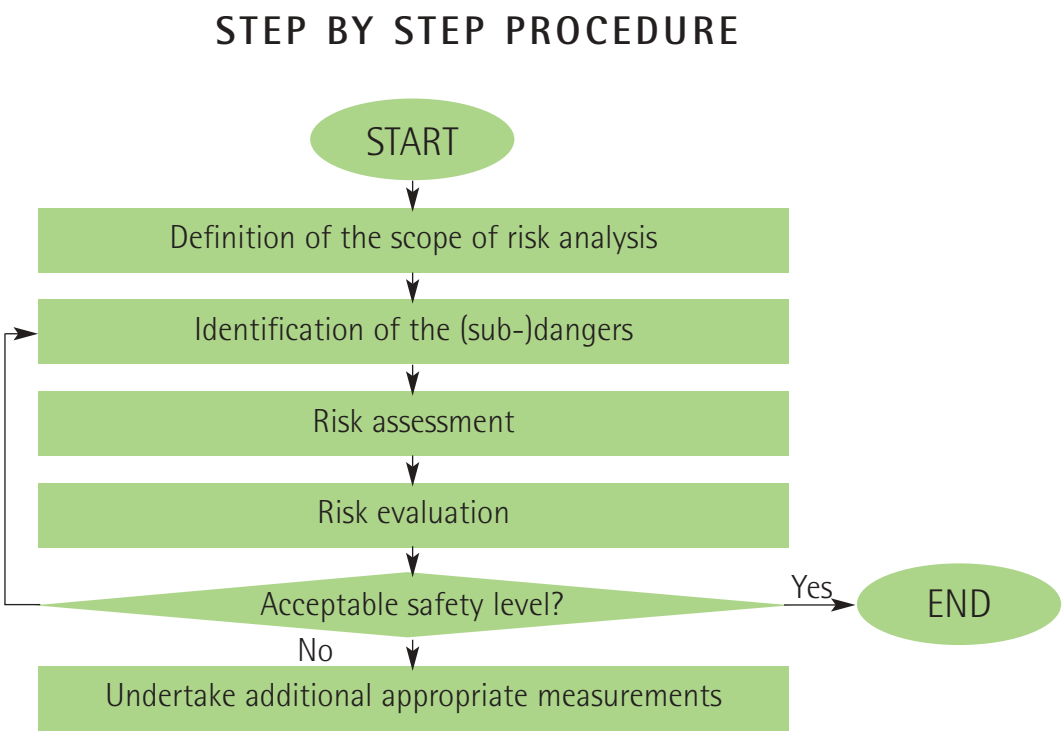
applying the "National Filtering Method" as described in annex A of EN 81-80.
In this annex the described "National Filtering Method" provides a tool for easy and successful defining of the *when* and *what* status of each predefined SNEL risk.
A specific checklist as resulting from the nationally applied filtering, should always be based on risk analysis.
The step by step risk assessment philosophy is documented in the next paragraphs.

3.2.2 Basic concept of a risk analysis:

A risk analysis is a series of logical steps that enable a systematic identification and study of hazards and their corresponding causes and effects.

The identification of hazards, when followed by an assessment of their severity and probability of occurrence, yields a measure of the risk associated with the individual hazards. Through the use of an interactive process, each hazard and effect is evaluated and either eliminated or, if necessary, controlled by means of appropriate safety measures that reduce the corresponding risk to an acceptable level of safety.

3.2.3 Summarising the step by step risk analysis procedure:



3.2.4 Defining the scope /reason for a risk analysis

Focusing on the safety and accessibility improvement of an existing lift installation, the risk analysis is intended to verify if the installation is operating at an acceptable level of safety.

EN 81-80 is the result of a risk analysis at European level. The national risk analysis will determine whether the identified risk(s), the described solutions and the scheduling (e.g.: 5-10 years) will be applied or if a more specific risk analysis will be executed taking into account the previous country history of lift regulation and applied standards, accident statistics, specific product knowledge and social expectations.

For this purpose the best approach is to form a risk analysis team by selecting the members and by choosing a team leader /moderator.
The members of the team and the team leader /moderator should, as a minimum requirement, have a working knowledge of the product or process being analysed.
The best results will be obtained by composing a team representing the different concerned parties such as lift users, lift technicians, lift inspectors, lift owners, government representatives, insurance companies, etc...

3.2.5 Identifying the hazard

An already identified SNEL risk can become subject to re-evaluation.
Even risks not included in the SNEL standard can become subject of an evaluation.

3.2.6 The risk assessment, the level of severity and frequency

Assess the cause and effect of each hazard in terms of probability of occurrence and the severity of its effects. The combination of severity and frequency of occurrence quantifies the risk associated with the hazard.
In SNEL, a specific frequency table according to ISO/TS 14798 for existing lifts has been edited. This table is fully included under point 3.3.2.

THE RISK ASSESSMENT

R=SxF

RISK is related to the considered hazard	**Is function of**	**SEVERITY** of the possible incidence for the considered hazard	**And**	**FREQUENCY (PROBABILITY)** Of occurence of the incident is function of: • frequency and duration of exposure • probability of occurence of hazardous event • possibility of avoiding or limiting the harm

CATEGORY OF SEVERITY

	Category of severity	Definition
I	Catastrophic	Death, system loss, or severe environmental damage
II	Critical	Severe injury, severe occupational illness, major system or environmental damage
III	Marginal	Minor injury, minor occupational illness, minor system or environmental damage
IIII	Negligible	Should not result in injury, occupational illness, system or environmental damage

LEVEL OF FREQUENCY

	Level of frequency	Definition
A	Frequent	Likely to occur often
B	Probable	Will occur several times in the lift cycle of the system
C	Occasional	Will occur at least once in the life cycle of the system
D	Remote	Unlikely, but may possibly occur in the life cycle of the system
E	Improbable	So unlikely that it can be assumed occurrence will not be experienced
F	Impossible	The hazard incident cannot occur unless caused by a deliberate act

3.2.7 Evaluation of the risk

Evaluate the risk assessment results in terms of residual risk and the acceptable level of safety. The table mentioned hereunder can be used to determine this. If the level of safety is unacceptable, further risk reduction measures are required and the following procedure should be used:

1. eliminate the hazard;
2. if the identified hazard can not be eliminated, take the necessary measures to reduce the risk to an acceptable level of safety as determined by the lift owner with the help of the lift technician;
3. inform the user of the residual risks. These measures include information, training, adding warning signs, personnel protection equipment, etc.

RELATION BETWEEN SEVERITY / FREQUENCY AND CORRESPONDING RISK LEVEL

Frequency		Severity			
		I Catastrophic	II Critical	III Marginal	IV Negligible
A	Frequent	IA	IIA	IIIA	IVA
B	Probable	IB	IIB	IIIB	IVB
C	Occasional	IC	IIC	IIIC	IVC
D	Remote	ID	IID	IIID	IVD
E	Improbable	IE	IIE	IIIE	IVE
F	Impossible	IF	IIF	IIIF	IVF

	Unacceptable – IA , IB , IC , IIA , IIB , IIIA	Corrective action required to eliminate the risk
	Undesirable – ID , IIC , IIIB, IIIC	Corrective action required to mitigate the risk
	Acceptable with review – IE , IID , IIE , IVA , IVB	Review required to determine whether any action is necessary – action as instructed by the lift owner
	Acceptable without review – IF , IIF , IIIE , IIIF , IVC , IVD IVE , IVF	No action required - action as instructed by the lift owner

3.2.8 Decision / corrective actions

If the risk evaluation still indicates that the remaining risk is not within an acceptable level of safety, the whole process has to be repeated.

3.2.9 Documentation and evaluation, the summary table

This document or table contains the result of the risk analysis process.

This documentation package should contain as a minimum:

- a definition of the system process that was analysed;
- the hazardous situations (hazard, causes and effects), risk assessment and risk evaluation;
- the reference data, used sources of data (e.g. codes and standards), historical information, drawings manufacturer, design calculations;
- the proposed risk reduction measures and residual risks;
- the risk profiles indicating the risks:
  - actual: assessment not considering the safety measures;
  - tentative: assessment assuming measures are taken.

Subject of the risk analysis:

Date: Responsible :

Case N°	Hazard (hazardous situation	Cause-trigger	Incident/Effect	Assessment actual S	F	Corrective action (risk reduction measure)	Assessment tentative S	F	Residual risk
1									
2									
3									
4									
5									
6									
7									
8									

S = Severity: Hazard effect category
I = Catastrophic
II = Critical
III = Marginal
IIII = Negligible

F = Frequency; Hazard cause level
A = Frequent
B = Probable
C = Occasional
D = Remote
E = Improbable
F = Impossible

3.3 SNEL and the identification and evaluation of hazardous situations

3.3.1 The list of significant hazards identified in SNEL

This SNEL list contains 74 hazardous situations (see table below). The hazardous situations mentioned there have been listed on the basis of experience gathered from registered accidents as well as specific risk assessments. The state-of-the-art for safety of the European lift industry in the last decades served as a basis. There may be additional hazardous situations for very old lifts or lifts with special technology which are not covered by this standard. In this case, additional risk assessments are necessary for the lifts in question.

TABLE – LIST OF SIGNIFICANT HAZARDS (#74)

Nr.	Hazard/Hazardous situation	Relevant clauses in EN 81-80
1	Presence of harmful materials	5.1.4
2	No or limited accessibility for disabled persons	5.2.1
3	Drive system with bad stopping/levelling accuracy	5.2.2
4	No or inadequate vandal resistance	5.3
5	No or inadequate control functions in case of fire	5.4
6	Well enclosures with perforate walls	5.5.1.1
7	Partially enclosed well with too low enclosure	5.5.1.2
8	Inadequate locking devices on access doors to well and pit	5.5.2
9	Inadequate vertical surface below landing door sills	5.5.3
10	Counterweight/balancing weight without safety gear in case of accessible spaces below well	5.5.4
11	No or inadequate partition of counterweight/ balancing weight travel path	5.5.5
12	No or inadequate pit screen for several lifts in the same well	5.5.6.1
13	No or inadequate partition for several lifts in the same well	5.5.6.2
14	Insufficient safety spaces in headroom and pit	5.5.7
15	Unsafe pit access	5.5.8
16	No or inadequate stopping devices in the pit or in the pulley room	5.5.9
17	No or inadequate lighting of the well	5.5.10
18	No alarm system in pit and on car roof	5.5.11
19	No or unsafe means of access to machine and pulley room	5.6.1
20	Slippery floor in machine or pulley room	5.6.2
21	Insufficient clearances in machine room	5.6.3
22	No or inadequate protection on different levels in machine pulley room	5.6.4
23	Inadequate lighting in machine or pulley room	5.6.5
24	Inadequate means of handling equipment	5.6.6
25	Perforate landing doors and car doors	5.7.1
26	Inadequate design of landing door fixings	5.7.2
27	Inadequate glass in doors	5.7.3

Nr.	Hazard/Hazardous situation	Relevant clauses in EN 81-80
28	No or inadequate protection against dragging of fingers on sliding car or landing doors with glass	5.7.4
29	No or inadequate lighting on landing doors	5.7.5
30	No or inadequate protective devices on power operated doors	5.7.6
31	Unsafe locking device of landing door	5.7.7
32	Unlocking of landing door without a special tool	5.7.8.1
33	Well enclosure with perforate walls near door locks	5.7.8.2
34	No automatic closing device on sliding doors	5.7.9
35	Inadequate link between panels of landing doors	5.7.10
36	Inadequate fire resistance of landing doors	5.7.11
37	Car door moving with open landing door	5.7.12
38	Large car area in relation to rated load	5.8.1
39	Inadequate length of car apron	5.8.2
40	Car without doors	5.8.3
41	Unsafe locking of car roof trap door	5.8.4
42	Insufficient strength of car roof	5.8.5
43	No or inadequate balustrade on car	5.8.6
44	Insufficient ventilation in car	5.8.7
45	Inadequate lighting in car	5.8.8.1
46	No or inadequate emergency lighting in car	5.8.8.2
47	No or inadequate protection means on sheaves, pulleys and sprockets against injury	5.9.1
48	No or inadequate protection against rope/chains leaving the sheaves, pulleys or sprockets	5.9.1
49	No or inadequate protection means on sheaves, pulleys or sprockets against introduction of objects	5.9.1
50	No or inadequate safety gear and/or overspeed governor on electric lifts	5.9.2
51	No or inadequate slack rope switch for governor rope	5.9.3
52	No protection means against ascending car overspeed on traction drive lifts with counterweight	5.9.4
53	Inadequate design of lift machine for electric lifts	5.9.4, 5.12.1
54	No or inadequate protection against free fall, overspeed and creeping on hydraulic lifts	5.9.5
55	Counterweight or balancing weight guided by 2 wire ropes	5.10.1
56	No or inadequate buffers	5.10.2
57	No or inadequate final limit switches	5.10.3
58	Large gap between car and wall facing the car entrance	5.11.1
59	Excessive distance between car door and landing door	5.11.2
60	No or inadequate emergency operation system	5.12.2
61	No shut-off valve	5.12.3
62	No independent starting contactors	5.12.4

Nr.	Hazard/Hazardous situation	Relevant clauses in EN 81-80
63	No or inadequate slack rope/chain device	5.12.5
64	No run-time limiter	5.12.6
65	No or inadequate low pressure device	5.12.7
66	Insufficient protection against electric shock and/or marking of electrical equipment; missing notices	5.13.1
67	No or inadequate protection on lift machine motor	5.13.2
68	No lockable main switch	5.13.3
69	No protection against phase reversal	5.14.1
70	No or inadequate inspection control station and stopping device on car roof	5.14.2
71	No or inadequate alarm device	5.14.3
72	No or inadequate communication system between machine room and car (travel height >30 m)	5.14.4
73	No or inadequate load control on car	5.14.5
74	Missing notices, markings and operating instructions	5.15

3.3.2 Definition of frequencies of accidents according to ISO/TS 14798

In carrying out risk assessments, the frequencies of incidents have to be estimated. Based on the number of accidents and incidents you have knowledge over, this combined with the estimated life cycle of a lift, the purpose is to link some predefined numerical values to the definitions of frequency according to ISO/TS 14798.

The life cycle of a lift in the past was assumed to be between 30 and max. 45 years. Today this life cycle is considered shorter because of the fast changing environment, the innovation in technology and the high expectations of the end users regarding ride comfort, building noise, optimal traffic, energy consumption, safety and accessibility. The result is a higher need for periodical upgrading of the installation, better reflecting the demands of a broader public of lift users.

TABLE – DEFINITION OF FREQUENCIES OF ACCIDENTS (ISO/TS 14798)

Level of frequency	Definition	Sub-level
A: Frequent	Likely to occur	
B: Probable	Will occur several times in the life cycle of the system	
C: Occasional	Will occur at least once in the life cycle of the system	
D: Remote	Unlikely, but may possibly occur in the life time of the system	C-D
		D
		D-E
E: Improbable	So unlikely that it can be assumed occurrence will not be experienced	
F: Impossible	The hazard incident should not occur unless caused by a deliberate act	

3.3.3 Risk profile, priorities and scheduling

TABLE – SNEL PRIORITIES AND SCHEDULE

Fields in risk profile		Priority	Schedule
S	**F**		
I II	A, B, C A	Extreme	Immediate, lift has to be stopped
I II III	C-D, D B, C, C-D A, B	High	Short term
I II III	D-E D C, C-D	Medium	Medium term or together with a major modernisation
I II III IV	E D-E, E D A, B	Low	Longer term or together with a modernisation of the related component
I II III IV	F F D-E, E, F C, C-D, D, D-E, E, F	-	-

Frequency (hazard cause level):
A Frequent, B Probable, C Occasional,
D Remote, E Improbable, F Impossible

Severity (hazard effect category):
I Catastrophic, II Critical,
III Marginal, IV Negligible

NOTE The length of the terms is subject to national filtering, e.g. short term within 5 years, medium term within 10 years.

TABLE – SNEL RISK PROFILE WITH PRIORITY LEVELS

Frequency	Severity I	II	III	VI
	Number of hazardous situation			
A	Extreme	Extreme	High	Low
B	Extreme	High	High	Low
C	Extreme	High	Medium	
C-D	High	High	Medium	
D	High	Medium	Low	
D-E	Medium	Low		
E	Low	Low		
F				

Frequency (hazard cause level): A Frequent, B Probable, C Occasional, D Remote, E Improbable, F Impossible	**Severity** (hazard effect category): I Catastrophic, II Critical, III Marginal, IV Negligible

3.3.4 The SNEL risk assessment: documentation and evaluation results

The 74 hazardous situations listed above were subjected to risk assessment during the preparation of the EN 81-80 standard.
The risk assessment was based on the assumption that an existing lift either has none or insufficient equipment for preventing the hazardous situations.

The result of the risk assessment is included in the table below and can serve as a basis, when applying the national filtering method.
The list is not exhaustive.

SNEL TABLE OF RISK ASSESSMENT RESULTS

Nr.	Hazardous Situation	Cause-Trigger	Incident/Effect	Assessment actual		Priority Level	Corrective Action
				S	F		See EN 81-80
1	Presence of harmful (materials such as asbestos in brake linings, well, etc.)	Exposure of harmful materials due to wear, ageing, etc.	Lung disease	I	D	H	5.1.4
2	No or limited accessibility for disabled persons	See EN 81-70	See EN 81-70				5.2.1, depending on conditions in the building
3	Drive system with bad levelling accuracy	Step between car and landing floor	Tripping of users, serious injuries	I II	D C-D	H	5.2.2 (e.g. regulated drive system, re-levelling device, etc.)
4	No or inadequate vandal resistance	See EN 81-71	See EN 81-71				5.3, depending on conditions of the building
5	No or inadequate control functions in case of fire	See EN 81-72	See EN 81-72				5.4, depending on conditions in the building
6	Well enclosures with perforated walls	Objects or limbs are passed into the well	Shearing and crushing of limbs, serious injuries	II	C	H	5.5.1.1
7	Partially enclosed well with too low enclosure	Person is leaning over enclosure and lift is moving	Crushing between enclosure and car, counterweight, or balancing weight, serious injury, death	I	D	H	5.5.1.2

Nr.	Hazardous Situation	Cause-Trigger	Incident/Effect	Assessment actual		Priority Level	Corrective Action
				S	F		See EN 81-80
8	Inadequate locking devices and electric safety devices on access doors to well and pit	Non authorised persons are entering the pit/well	Persons are crushed by moving parts, serious injuries, death	I	D	H	5.5.2
9	Inadequate vertical surface below landing door sills	Car is levelling or re-levelling with open doors, user gets feet below sill of landing door	Crushing of feet, serious injury	II	C-D	H	5.5.3
10	Counterweight/ balancing weight without safety gear in case of accessible spaces below well	Free fall of counterweight/ balancing weight due to broken suspension	Pit floor collapsed and persons in spaces below well injured or killed	I	E	L	5.5.4
11	No or inadequate partition of counterweight/ balancing weight travel path	Maintenance/ inspection person in the pit is walking into this travel path when lift is moving	Crushing, serious injuries or death	I	E	L	5.5.5
12	No or inadequate pit screen for several lifts in the same well	During maintenance/ inspection on one lift adjacent lift is moving	Maintenance/ inspection person in the pit comes into contact with moving parts of adjacent lift; serious injuries, death	I	D	H	5.5.6.1
13	No or inadequate partition for several lifts in the same well	During maintenance/ inspection on one lift, adjacent lift is moving	Maintenance/ inspection person on the car comes into contact with moving parts of adjacent lift; serious injuries, death	I	D	H	5.5.6.2
14	Insufficient safety spaces in headroom and pit	The car is overrunning the upmost or the lowest floor with a person on the car roof or in the pit	Person is crushed, serious injuries or death	I	D	H	5.5.7
15	Unsafe pit access	Falling when entering or leaving the pit	Serious injuries	II	C-D	H	5.5.8
16	No or inadequate stopping devices in the pit or in the pulley room	Uncontrolled movements	Contact with moving parts, shearing or crushing	I	D	H	5.5.9

Nr.	Hazardous Situation	Cause-Trigger	Incident/Effect	Assessment actual S	Assessment actual F	Priority Level	Corrective Action See EN 81-80
17	No or inadequate well lighting	Maintenance/ inspection person is tripping or gets in contact with moving parts	Falling and crushing, serious injuries or death	I II	D C-D	H	5.5.10
18	No alarm system in pit and on car roof	Person trapped or injured in the pit or on the car	Rescue and treatment of injury not in time, serious injury	II	D	M	5.5.11
19	No or inadequate means of access to machine and pulley room	Authorised person is entering or leaving the machine and pulley room	Falling, serious injury	II	C-D	H	5.6.1
20	Slippery floor in machine or pulley room	Authorised person is slipping and falling	Contact with obstacles or moving parts, serious injury	II	D-E	L	5.6.2
21	Insufficient clearances in machine room	Authorised person moving or working, unexpected movement of equipment	Contact with moving parts, serious injury	II	D	M	5.6.3
22	No or inadequate protection on different levels in machine room	Authorised person is moving in the machine room	Falling, serious injury	II	C-D	H	5.6.4
23	Inadequate lighting in machine or pulley room	Authorised person is moving	Tripping, contact with moving parts or electric shock	II	C-D	H	5.6.5
24	Inadequate means of handling equipment	Moving of heavy lift equipment, failure of supporting means	Crushing of maintenance persons, serious injury	I II	E D	L	5.6.6
25	Perforated landing and car doors	Limbs are passed through openings	Shearing and crushing of limbs, serious injuries	II	C	H	5.7.1
26	Inadequate design of landing door fixings	Person pushes the door, door collapses	Person falling into well, serious injury or death	I	D	H	5.7.2
27	Inadequate glass in doors	Glass is broken by impact, person passes limbs through opening	Falling into the well, shearing of limbs, serious injury or death	I II	D C-D	H	5.7.3
28	No or inadequate protection against dragging of fingers on sliding doors with glass	Person (child) touches glass and door start to move	Fingers are dragged into gap between door panel and frame	III	D	L	5.7.4

Nr.	Hazardous Situation	Cause-Trigger	Incident/Effect	Assessment actual		Priority Level	Corrective Action
				S	F		See EN 81-80
29	No or inadequate lighting on landings	Users entering or leaving the lift	Tripping and falling	III	C-D	M	5.7.5
30	No or inadequate protective devices on power operated doors	Person is passing the doors when door starts closing	Person is hit or jammed by the door, serious injury	II III	C B	H	5.7.6
31	Unsafe locking device of landing door	Landing door closed but not properly locked, person opening the door	Person falling down the well, serious injury or death	I	D	H	5.7.7
32	Unlocking of landing door possible without a special tool	Persons unlock and open a door	Person falls into the well, serious injury or death	I	D	H	5.7.8.1
33	Well enclosure with perforated walls near door locks	Person is unlocking the landing door without a special tool, e.g. a stick	Person falling into well, serious injury or death	I	D	H	5.7.8.2
34	No automatic closing device on sliding doors	Door remains open after emergency unlocking or when car leaves the floor due to creeping	Person falls into well, serious injury or death	I	D	H	5.7.9
35	Inadequate mechanical link between panels of landing doors	Mechanical link fails, one panel remains open	Shearing or falling of persons, fatal or serious injuries	I	D-E	M	5.7.10
36	Inadequate fire resistance of landing doors	Fire in front of landing door is spreading into well and to next floor	Persons in upper floors killed by fire and smoke	I	D-E	M	5.7.11
37	Car door moving when landing door is opened	Person entering the car before the car door is fully opened	Trapping and shearing of hands	III	C	M	5.7.12
38	Large car area in relation to rated load	Lift is not used as intended, car is overloaded with persons and/or load, car slips away from landing	Persons are sheared and crushed, serious injuries	II	D-E	L	5.8.1
39	Inadequate length of car apron	Rescuing of trapped persons when car is stopped above landing	Falling down the well	I	D	H	5.8.2

Nr.	Hazardous Situation	Cause-Trigger	Incident/Effect	Assessment actual S	Assessment actual F	Priority Level	Corrective Action See EN 81-80
40	Car without doors	Goods in car hit sill or recesses on wall and tip	User crushed, serious injury or death	I	D	H	5.8.3
		Person (child) enters gap between car sill and wall	Shearing and cutting of limbs, serious injury or death	I II	D C-D		
41	Unsafe locking of car roof trap door	Car moves with trap door open, e.g. transport of long goods	Person crushed in car	II	D	M	5.8.4
42	Insufficient strength of car roof	Maintenance/ inspection persons on car roof, roof collapses	Falling through the car roof shearing and cutting	III	D	L	5.8.5
43	No or inadequate balustrade on car	Maintenance/ inspection person trips or stumbles and falls into space between car and wall	Falling down the well, serious injury or death	I	D	H	5.8.6
44	Insufficient ventilation in car	Breakdown of lift, persons trapped	Suffocation, heat exhaustion, panic	II	D	M	5.8.7
45	Inadequate lighting in car	Persons entering or leaving the car	Tripping and falling	III	C-D	M	5.8.8.1
46	No or inadequate emergency lighting in car	Persons are trapped in car due to loss of power supply	Panic, claustrophobia	III	C	M	5.8.8.2
47	No or inadequate protection means on sheaves, pulleys and sprockets against injury	Maintenance/ inspection person gets in contact with sheaves, pulleys or sprockets	Fingers or part of clothes trapped	II	D	M	5.9.1
48	No or inadequate protection means against ropes/chains leaving the sheaves, pulleys or sprockets	Ropes/chains leave sheaves, pulleys or sprockets, uncontrolled movements, tripping of safety gear	Injury of persons, damage of material	II	D	M	5.9.1
49	No or inadequate protection means on sheave, pulleys or sprockets against introduction of objects	Objects falling between rope/chain and sheave, pulleys or sprocket	Damage on rope/chain or sheave, pulley or sprocket	III	D	L	5.9.1

Nr.	Hazardous Situation	Cause-Trigger	Incident/Effect	Assessment actual		Priority Level	Corrective Action
				S	F		See EN 81-80
50	No or inadequate safety gear and/or overspeed governor on electric lifts	Overspeed down or free fall of car due to suspension failure, breaking of traction sheave shaft, brake failure, etc.	High deceleration of safety gear or crushing into pit, serious injury or death	I II	D C-D	H	5.9.2
51	No or inadequate slack rope switch for governor rope	Overspeed of car, governor doesn't trip safety gear due to slack governor rope	Persons in car crushed, serious injury or death	I	D-E	M	5.9.3
52	No protection means against ascending car overspeed on traction drive lifts and positive drive lifts with counterweight	Overspeed in up direction due to failure of traction sheave shaft, brake failure, failure of electrical system, etc.	Person in car is crushed when car hits the roof of the well Maintenance person is crushed on car roof	I II	D-E D	M	5.9.4
53	Inadequate design of lift machine of electric lifts	Failure of lift brake or other part between brake and traction sheave/drum. Uncontrolled movement at landing with open doors	Person is sheared between landing and car door	I	D	H	5.9.4, 5.12.1
54	No or inadequate protection against free fall, overspeed and creeping on hydraulic lifts	Failure of suspension means, rupture of hydraulic piping, oil leakage, etc.	Car crushes into pit, persons crushed Car leaves landing with door open and person falls down the well	I	D	H	5.9.5
55	Counterweight or balancing weight guided by 2 wire ropes	Broken or slack guiding ropes	Counterweight/ balancing weight hits car, people in the car crushed	I II	E D-E	L	5.10.1
56	No or inadequate buffers	Car or counterweight/ balancing weight is hitting the buffers due to a failure in the mechanical or electrical system	Users in car or maintenance persons on car roof crushed, serious injury	II	C-D	H	5.10.2
57	No or inadequate final limit switches	Car doesn't stop at extreme landings and continues to run	Damage on machinery if run time limiter fails	III	C	M	5.10.3