SAFETY OF LADDERS

Interim Report to the GPSD Committee from the Experts' Group

January 2009

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Preface

In 1999 the Commission issued mandate M/285 to CEN with the view to revise the existing standard EN 131:1993.

In the Commission's view, the European ladder standard needed a thorough improvement of its almost inexistent safety provisions, so as to make ladders a safe product in any circumstance of use and misuse, regardless of the age of the user or the specific activity.

At the beginning of 2007, a draft revised standard did not manage to go through the natural standard making process and was rejected at the voting stage. After almost 10 years of much debate and discussion in CEN, no substantial change has been therefore achieved in terms of safety tests and requirements for ladders.

A group of ladders experts, volunteered by some Member States in the GPSD Committee, as well as ANEC, met in 2008 from April to December, with the view to take stock of the past, assess what went wrong in the process and identify possible ways forward in terms of recommendations on technical issues and governance of the standardisation process. These recommendations are in Section 3 of this Report, whereas Section 4 contains information on the functioning of the group.

This Interim Report contains the main results of the work carried out by the experts. SSection 4, describing the group and its working methods, will be completed for the Final Report.

1 THE ISSUE

1.1 Ladders: danger at home

According to the IDB (Injury Data Base), every two minutes someone dies of a fatal accident in the EU-27. 80% of these accidents happen at home or during leisure time. Some products are regularly involved in these accidents, such as ladders, which consistently rank in the "top-10" list of most dangerous utensils and tools in the domestic area in Europe. In the DIY area, ladders have become the most dangerous consumer product, involved in 39% of fractures recorded at home between 2003 and 2005 in Europe[1].

Virtually almost every household in Europe has at least one ladder. Their use is often taken for granted. Some ways of using the ladders are instinctive, yet very dangerous, exposing the user to serious risks, such as over-reaching/over-balancing or erecting the ladders at a wrong angle. Furthermore, slippery rungs, overstressing or overloading of the ladders, ladders resting against fragile or moveable structures or the defective condition of the ladder itself can lead to serious or even fatal accidents. Safety requirements should be therefore conceived in such a way as to take these situations into account, so that the risk is eliminated already at the design stage.

Moreover, with a constantly aging population in the EU, ladders are being used more and more by elderly people. Hence the need for a product that is safe in every circumstance and with any user.

1.2 Standards and legislation

There is a European standard for ladders - EN 131 Parts 1-4 - but its safety requirements are unsatisfactory, as basic requirements such as ladder stability and durability are not covered. Compared to other existing ladders standards in the world, it could be easily argued that Europe, as a whole, has the poorest level of ladders safety worldwide.

Most Member States have no specific requirements for ladders in their legislation, some countries do link their legislation with EN 131 - sometimes adding further requirements- whereas some other have dedicated national legislation on ladders (e.g. the Netherlands). This is an additional factor of concern, as European consumers are exposed to different level of protection, according to the country they bought their ladder in. Such fragmentation is against the common objective of setting an internal market of safe products.

1.3 European standardisation on ladders

In 1999 the Commission issued a Mandate to CEN with the view to making standard EN 131 safer. The mandate was accepted by CEN and allocated to CEN/TC 93.

A revised version of EN 131 part 1 has been published along with new EN 131 parts 3 and 4. These parts deal with definitions, user instructions and hinged ladders. However, the much-awaited, improved substantive safety requirements which would be included in EN 131:2 are not available yet. A draft revised version of EN 131-2, pr EN 131-part 2, on safety requirements and test methods, was rejected at the beginning of 2007. This draft omitted consideration of important safety concerns covered in the Mandate. This leaves the situation

[1] See also "*Ladders, deadliest DIY danger*" , 18 March 2001 on http://news.bbc.co.uk/2/hi/uk_news/1227441.stm

on the substantive safety issues unchanged, after almost 10 years have passed since the mandate was accepted by CEN.

Whereas the drafting of a new part, EN 131-3 on instructions, can be considered a positive result, the fact remains that Europe still has the lowest level of ladder safety in the world and it is unclear when and if a new, safer standard will be available.

1.4 Concerns by the Member States

In 2007, after the rejection of pr EN 131-2, the Member States, represented in the Committee of the General Product Safety Directive, agreed that the safety ladders had to be addressed with priority and a close follow up of the handling of the Commission's mandate by CEN TC 93 was required. Some Member Sates volunteered one of their experts to form a working group, coordinated by a DG SANCO official, with the task to review the process within TC 93, to assess existing difficulties and recommend possible ways forward to overcome the problems encountered by CEN TC 93. The ultimate objective is to set a realistic roadmap towards a new, safe standard within a reasonable timeframe.

1.5 Recommendations and roadmap

The group has prepared the recommendations contained in this document which should be addressed to CEN TC/93, after submission to the GPSD Committee. These recommendations are not a new mandate –they are rather a reference document for CEN/ TC 93 providing guidance on how the Commission's mandate should be interpreted.

After almost 10 years without a tangible result, it is necessary to take stock of the past, identify the critical points, assess what went wrong in the process within TC 93 and suggest concrete solutions.

Also, as the contract linked to this mandate was closed by DG ENTR in 2004, because of substantial lack of progress, a contractual obligation for CEN to deliver the work (intermediate stages and final) within pre-identified deadlines does not exist any more.

To ensure that work within CEN TC 93 can progress steadily and efficiently towards the adoption of a final standard, the group has also identified a timeframe, with intermediate milestones, within which the revision of EN 131-2 could be reasonably achieved.

2 FIFTEEN YEARS OF STANDARD-MAKING FOR LADDERS

2.1 Historical background

1983-1993 Working on first version of the standard, many conflicts. Convenor paid by German industry, secretariat from DIN, strong influence DIN standard.

1993 After several voting rounds in different ways (not according to CEN rules) standard introduced (EN131:1993). In general: safety level not motivated. Requests for A-deviation ignored.

1998 On the 5th anniversary of the 1993 standard, the CEN evaluation process begins. Same convenor and secretariat which adopted the standard. Requests for revision of contents from several countries, convenor makes clear that only limited editorial changes will be accepted and not discussions on the contents will take place.
Most delegations are represented by manufacturers, often big industries as small enterprises cannot afford participation in the committee. Very limited technical and safety expertise in TC. Poor representation of user organisations. This scenario is bound to remain unchanged until nowadays.

1999 Mandate, proposal to work out solutions in Working Groups (WGs), no budget available: members of WGs have to pay/contribute for research etc. themselves. Many do so.

2000-2003 In WGs research done, data collected and many well motivated (test) proposals produced.

2003 Many already agreed proposals withdrawn/blocked by commercial members of WGs (sometimes openly for commercial reasons or for protecting existing products) or TC.
Standard on step stools, EN 14183 was developed and accepted as an interim compromise and under condition that it would be revised as soon as the new EN 131 became available. The EN 14183 contains limited safety requirements. However, as the revision process of EN 131 went on, it became clear that all stepladders up to 1 meter height (about 50% of household stepladders) would fall under the step stool standard instead of EN 131 (however this was never decided in TC).

2004 Slip test and durability test accepted by majority under strong protest by DIN. As "consolation", material requirements were introduced.
Notwithstanding several requests to chairman, letter by ANEC not discussed because of "lack of time" in 3 days meeting[2].
Several written protests to convenor and CEN against process/acting of convenor and secretariat, more or less ignored.

2005 First meeting: presentation by DIN on why durability test should be deleted. This was not on the agenda (and despite the fact that similar requests had never been granted to other delegations). DIN explained that durability test was unnecessary on the basis of extensive testing, but refused to share detailed data with the group.

Convenor makes clear to ANEC representative that her input is not "welcomed". In the subsequent report of the meeting, neither the discussion with ANEC representative, nor her presence is mentioned.
Second meeting: Four new member states take part in the meeting; all represented by importers of German ladders manufacturers. Some minor cosmetic changes were included to the draft revised standard. Key improvements, such as slip and durability tests, were relegated to the role of "preliminary work items" and assigned to a special task force (TF), chaired by the DIN. In this way, these important tests were taken off from the body of the standard but would be considered for further revision of the standard.

2006 Despite the strong pressure from BSI, the first meeting of the TF was organised too late to make any useful addition to the ongoing inquiry version of the revised standard. At the same time, the special TF did not produce any result.
Further to the pressure from AFNOR, the requirements for standing surface of rungs were loosened up to accommodate existing, "cheap" products in the market. Owing to the pressure from BSI and NEN, and with much resistance from DIN and the convenor, the TF was required to laid down a plan of activities and to deliver substantive results in 2006.

2007 At the enquiry stage all delegations active in the process, except DIN, rejected pr131:2. Several reasons are behind this failure: some delegations did not want any change to the status quo; for others, instead, the changes proposed were incompatible with a high level of consumer safety and also an indirect form of disapproval on how the process had been managed until then. At the plenary of the TC, the EC Commission representative warned that the current EN 131:2 is below the required safety level of the GPSD and is therefore not acceptable. Her intervention was not accurately reported in the minutes, to the extent that the EC Commission representative requested that the minutes be revised for the relevant part.

A part from the proposal to request funding to the EC to carry out some tests, no other concrete action was planned. At the same time, the meetings of the special TF became less and less frequent and poorly structured (no agenda).

2008 No progress from TC concerning the application to the EC for additional funding. At the same time, TC Secretariat tries to get controversial subject (test load of

[2] See section 3 and Annex

major load test) from rejected part 2 in accepted part 1 (terms and definitions) by resolution, counting abstentions as votes in favour (against CEN rules). After strong protests by BSI the abstentions are not counted and the vote is negative. A new resolution with the same contents but another wording is launched for voting, but the result is again negative. Eventually, during the plenary meeting in September 2008, the issue was tabled and this time the result was positive. The situation as it stands now is that high users' weight is now allowed on ladders, whereas the safety requirements supporting this decision are not available yet as they are still under discussion.

2008 2009 DIN representative, Chairman of TC/93, steps down. Convenor of the TF, another member of the DIN delegation, is appointed new Chairman. The function of leading the core work for the revision of the standard and the function of checking and monitoring that that work is done in accordance with the mandate and in a timely fashion are now held by the same person.

2.2 Mandate M/285

Mandate M/285, adopted on 12 July 1999, contains a main part which includes:

- Hazard identification,
- Ladder accident statistics,
- National European regulations and Standards (both in Europe and in third countries)
- Studies
- Required improvements

Since the part on "**Required improvements**" is drafted in generic terms ("*the products characteristics", "minimum risk compatible with the product's use*"), the mandate lists in an informative annex more specific descriptions of the improvements that are to be expected from the revision of the standard, with particular focus on definitions, products to be excluded from or included in the revision, physical properties, technical improvements and specific tests.

Both the main body and the informative annex are essential parts of the mandate and have undergone the same decision-making process within the Commission for their adoption. The Technical Annex is, therefore, an essential part of the mandate, in terms of objectives to be achieved.

The Experts believe that, despite the fact that the mandate (and the informative annex, which is an inextricable part of it) was drafted almost 10 years ago, it is still a valid document which provides an exhaustive set of demands for improving the safety of ladders in Europe.

Annex A to this Report contains the text of Mandate M/285 .

3 RECOMMENDATIONS

3.1 Recommendations on technical requirements

The Experts have identified the following technical recommendations which should complement the specific requirements already identified in prEN 131:2, rejected by CEN/TC 93 at the beginning of 2007:

General recommendations

1) The standard should privilege **performance requirements** and be free from any design restrictions or material prescriptions, wherever possible. Restrictions on design or material prescriptions, apart from quality or performance of materials, hinder or block innovation, and therefore progress in safety, economical and environmental aspects. They are barriers to both trade and innovation

2) Tests and requirements should be **representative** of the product in actual use. The tests outlined in prEN131:2 bear little relation to real-life conditions of use of a ladder. As the tests are executed to prevent accidents in reality, these should be drafted focusing on realistic scenarios.

3) The **minimum rated load permitted for a ladder shall be 120kg or greater**. If higher weights are allowed, it is preferable to do this in steps, for instance 125kg user weight, 150kg user weight, 175kg user weight.

4) The relationship between **ladders and accessories** (including safety and stability devices) shall be addressed in the standard in relation with stability requirements but only after these have been developed. In other words, sound stability requirements for ladders are a pre-requisite for developing requirements for ladder devices.

Specific recommendations

- **Stability**

Ladder stability is a major root-cause in accidents involving ladders. Research on leaning ladders has shown that **base slip** and **movement of the top of the ladder** are the top causes of accidents. Similarly, for stepladders, one study has shown **sideways tipping** to account for 40% of accidents[3].

There was hardly any reference to stability testing in the rejected pr EN 131:2 , despite the specific instruction in the Mandate to include stability considerations in EN131:2 *("…the ladder should be designed so tat it remains stable in the most unfavourable conditions of loading and use"*…page 14 of Mandate M/285). Sound research has already been carried out on forces generated during foreseeable use of straight ladders and stepladders. In conjunction with appropriate user information and guidance, it is therefore possible to devise criteria and tests for stability of ladders and ladders fitted with safety devices. Such criteria and test procedures should be included in the new EN131:2.

More specifically, EN 131-2 shall include stability requirements and methods of assessing the stability of the ladder during conditions of use with respect to the following failure modes as appropriate:

[3] Data provided by UK HSE

a) Top slip
b) Bottom slip
c) Ladder flip
d) Loss of top contact

- **Durability**

EN 131-2 should include methods of assessing the durability of the ladder, as required by the Mandate.
Durability testing is important because, during the lifetime of the ladder, the ladder will sustain wear and degradation which is not assessed by the load tests.

- **Load tests**

The test loads used should be representative of the ladder in use and shall include a reasonable safety factor and factors to incorporate both the dynamic and asymmetric nature of loads experienced in use. With increasing weights of persons all over Europe 120kg (including clothing and equipment carried) is a value that can be realistically expected.

In the current EN 131:2 products are tested in horizontal position, thus neglecting forces in other directions. All known forces to which the ladder will be subjected during its use should be taken into consideration.

- **Ladder classes**

EN 131-2 should include definitions and requirements for **two ladder classes**, one for professional/semi-professional/frequent use and one for domestic/infrequent use. The standard should contain requirements for the professional/frequent use ladder that reflect its higher frequency of use and potentially more onerous conditions of use. The main difference between consumer use and some professional use is the frequency. This should be reflected in the test method.

- **User stability**

Certain step ladders (above a reasonable height, which needs to be identified by the standard) should be equipped with a handrail or knee rail to support the user when standing on the uppermost standing surface. On a small standing surface, like a stepladder platform, it is almost unavoidable to loose balance if there is no other support, especially as the user will often be concentrating on the task at hand while using the ladder. This is an example of foreseeable condition of use, which is the supporting frame of mind of the entire mandate. At present when supports are mounted, they are usually 600mm high. This is more or less at knee level, whereas a higher support could give more safety.

In addition, the Experts have also identified the items listed below, which although they are not explicitly mentioned in the mandate, they may have ultimately a strong impact on the stability of the ladder and of the user. The experts therefore recommend that the GPSD Committee and the Commission should require CEN to assess whether these topics shall be covered by the draft standard and report back.

- ✓ **Erecting long ladders**

Erecting multi part ladders without rope operation has either to be done standing on the ladder itself or on the ground and subsequently putting it against the wall. Both methods have considerable risks for the health of the user.
There is a point at which it is no longer safe to erect a multi part leaning ladder, which is not rope operated. Practical tests should be carried out to determine this point so that any appropriate modifications to the standard can be determined.

- ✓ **Unequal step distance**

There is some concern that the design practice of reducing the distance from the bottom step of a ladder to the ground (compared to the regular step/rung distance of the ladder) could increase the risk of accidents.

- ✓ **Rung Shape**

There is some concern that rung shape may be a factor in some ladder accidents (slipping) and has direct impact on user stability.

The experts will also provide to the European Commission a more technically detailed description of the above listed points.

3.2 Recommendations on further research

CEN TC/93 claims that additional research, and the funding to be obtained by the European Commission, is almost a "*conditio sine qua non*" to moving on.

The Experts believe that existing research, studies, relevant standards in other jurisdictions outside the EU, and the expertise of the members of the TC, provide a solid scientific background for developing the safety requirements.

For some specific points relating to durability and stability which have been holding up the discussions in the TC, the experts recommend that TC should carefully review existent research and available data and then decide promptly whether additional investigation and research is indeed necessary.

The experts also suggest that TC/93 should explore the possibility of carrying out "in-house" testing, which some ladders manufactures are willing to develop for the TC.

The Experts underline, however, that the application for funding for additional tests, if found to be absolutely necessary, should move in parallel with the developments of tests for those issues for which research is clearly not necessary. Furthermore, the funding question for additional tests should not become, under any circumstance, a reason for delaying or holding up the work for drafting the revised standard.

3.3 Recommendations on governance issues

The group has also identified several hindrances in the governance of the standard-making process. These hindrances have not been properly addressed by the management of the Technical Committee in the past 10 years.

Some of the problems listed below are recurrent. In the long run, these problems have built up a climate of frustration or general dissatisfaction in the Committee, which is not conducive to the necessary consensus to complete the process. More importantly, if not addressed properly and quickly, this climate can severely interfere with the development of a high quality standard capable of ensuring the safety of European consumers, which is the ultimate purpose of the Commission's mandate.

The group recommends that action should be taken by CEN and the Commission to address the following points:

- ✓ progress of work inordinately slow on critical work items;
- ✓ overrepresentation of industry in the Committee; in general imbalanced participation (very few representatives from health and safety authorities, as compared to industry)
- ✓ inaccurate recording of discussions;
- ✓ participation in meetings poor and irregular;
- ✓ voting positions that do not reflect the result of the discussions
- ✓ complaints from delegations not followed up or investigated

Annex B to this report contains a sample of letters sent by national regulators, ANEC and standardisation bodies to CEN and to the Commission, which provide a first-hand account of the issues mentioned above.

The Experts also recommend that the Commission should monitor closely a recent development in the management of the TC whereby the Convenorship of the Task Force and the Chairmanship of the TC are now held by the same person. The Experts recommend that the GPSD Committee and the Commission should request CEN to provide solid and realistic reassurances that this development will play in favour of a timely and satisfactory delivery on the Commission's mandate by CEN and the TC.

3.4 Recommendations on timing

The Experts believe that, on the basis of the results already achieved in the rejected prEN131-2:2006, the existing knowledge, data, research, expertise and solutions available in other standards, a draft revised standard could be reasonably completed within a timeframe of 18 months, before the launching of the voting procedure (roughly 12 months for developing the standard + 6 months for procedural steps before the vote), including timing for those items that need dedicated research. This timeframe was also discussed and agreed with the Convenor of the CEN/TF who took part in the meeting of the group held in October 2008.

The milestones provided in this table could realistically be used to measure progress. Under normal circumstances, slippage of maximum 1 month per stage is considered as acceptable.

Stage	When
First draft from Task Force in TC/93	June 2009
Adoption Final version	September 2009
Launch Public enquiry	December 2009
End Public enquiry	June 2010
Launching Formal vote	October 2010