

Stop Defeating the Safeguards of Machines

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DEFEATING, TAMPERING, BYPASSING, PROTECTIVE DEVICE, SAFETY CULTURE

ABSTRACT

In 2006 a report regarding the defeating of safeguards of machines has been published. One result was the conclusion, that approximately 1/3 of safeguards of machines are permanently or temporarily defeated, therefore the risk of injuries for people working on such a machine is significantly increased. Approx. 25% of the accidents on machines happen due to defeated protective devices. Assuming this percentage, in Germany 2008 happened more than 10 000 accidents and 8 persons died due to defeating. Although several initiatives started already to reduce the amount of defeating, this issue is still not adequately present in the field of occupational safety and health. Since it is an international problem, ISSA (International Social Security Association) started a project to raise awareness, that defeating is a problem. Machine builders and machine users shall be motivated and supported to prevent defeating. Austria, Germany, Italy and Switzerland are already participating. The website www.stop-defeating.org is currently going online. But this is the first step only and there is still some work to do, like preparing publications, describing good machine designs and application hints, compile translations etc. Everybody interested to help tackling this global challenge and to support the project is welcome.

1 INTRODUCTION

In February 2006 the German Social Accident Insurance (DGUV formally HVBG) published a report regarding the defeating of safeguards of machines [1]. Defeating¹ is the rendering inoperative of protective devices with the result that a machine is used without the necessary safety measures as shown in the examples of Figures 1 and 2. In Figure 1 the position of the protective guard of the machine is detected by a position switch. The part actuating the switch is normally fixed to the door. In this example, the actuator has been removed from the door and put into the switch. Therefore, the switch inadvertently detects the protective guard closed and all dangerous machine movements are possible. The key in Figure 2 is part of a machine panel and bypasses the protective guard. It is marked "Schutztürüberbrückung" (Bypass Protective Guard) and does not activate any alternative protective equipment. Therefore all dangerous machine movements are possible while the guard is open.

One result of the HVBG study was the conclusion, that approximately 1/3 of safeguards of machines are permanently or temporarily defeated. Due to this situation the risk of injuries for people working on such a machine is significantly increased. Another result is, that approx. 25% of the accidents on machines happen due to defeated protective devices. Assuming this percentage, in Germany 2008 happened more than 10 000 accidents and 8 persons died due to defeating. These numbers emphasise, that actions to decrease the amount of defeated machines are more than necessary.

¹ The following expressions are also used to describe defeating: tampering, bypassing, overriding, cheating



Figure 1: Defeating of a position switch on a protective guard of a machine



Figure 2: Defeating of a protective guard by key
Label: "Bypass Protective Guard"

2 MAIN FINDINGS OF THE STUDIES AND FIRST REACTIONS

All the details of the HVBG study can be found in the report [1], but some highlights are shown in Table 1.

Estimations of OSH experts (inspectors and safety experts)	
Percentage of permanently defeated protective equipment	14 %
Percentage of temporarily defeated protective equipment	23 %
Percentage of machinery with potential accidents due to defeating	51 %
Percentage of accidents caused by defeating	25 %
Percentage of companies suffering from defeating	34 %

Table 1: Some results of the HVBG study

In addition, the reasons for defeating are described, the corresponding operational modes are known (see Figure 3), the techniques applied to defeat are mentioned etc.

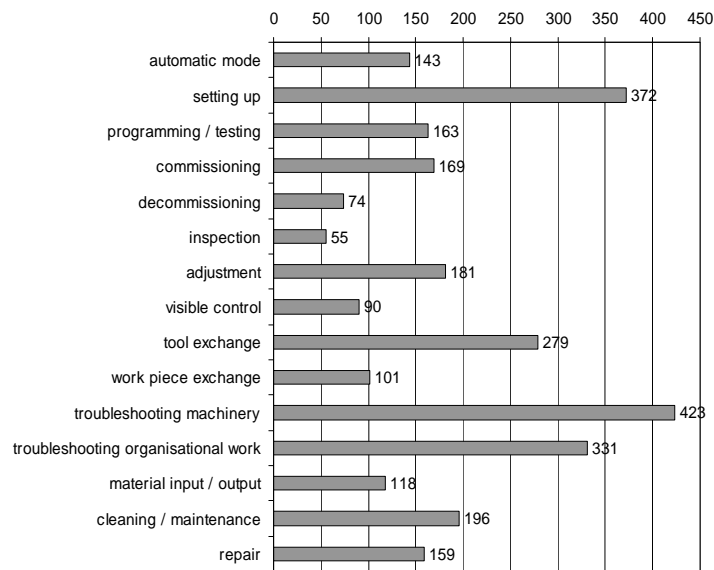


Figure 3: Operational modes while defeating

Knowing all the details, the study identifies the following areas, where measures are necessary:

- Design and development of machines
- Innovative protective concepts
- Standardisation
- Machine operation
- Education of safety staff, operators and construction engineers

Further surveys of this subject have been performed by SUVA [2] and BGN [3]. The results of these studies are similar to the findings of the HVBG project. Subsequently, SUVA started in 2007 a campaign, addressing machine manufacturers and users. The objectives are e. g. to raise awareness about defeating and to establish a culture in the companies:

“It's never a solution to defeat safeguards of machines!”

SUVA informs managers and employees how to work efficiently with an active safeguard and about the possible legal approaches when violating the laws. When defeated safeguards are noticed the enforcement is now intensified in Switzerland.

3 CURRENT SITUATION

Knowing about the amount of defeated machines does not solve the problem, a lot of activities are necessary. They already started after publication of the HVBG study, e. g.

- Some examples of good machine designs are already published
- Some international standards address defeating quite reasonable
- Several articles have been published
- A checklist allows to examine the incentive with defeated protective devices [4] and helps to improve construction
- A checklist to be applied before the purchase of machinery is available from DGUV, so the incentive of defeated protective devices can be examined

But the issue of defeating is still not adequately present in the field of occupational safety and health. The man-machine interfaces are not sufficiently fitted to human demands; the integration of safety measures in the construction phase of machines is not yet realised either. Earlier trade-offs between constructing engineers, electrical engineers and providers of safety equipment are still required. There is nearly no integration of the

subject into the safety culture of the companies. The concerned parties should consider all life and operating stages of machinery during construction and so on ...

The problem of defeating protective devices cannot be solved by some “isolated” actions, but needs permanent consideration.

4 ISSA PROJECT

Some initiatives to reduce defeating have been started but seem to be limited to Switzerland, Italy and Germany. Since the subject of defeating of safeguards has to be considered an international problem, ISSA (International Social Security Association) decided to start an international project regarding defeating:

Stop Defeating the Safeguards of Machines.

The participants of that project group are already (see clause 7 for web links):

AUVA	Austria
BGN	Germany
BG Metall Nord Süd	Germany
Maschinenbau- und Metall-BG	Germany
IFA	Germany
ISPESL	Italy
SUVA	Switzerland

There have been already some meetings of the project group and several targets have been identified, e. g.:

- Raise awareness, that defeating is a problem
- Distribute knowledge, how to avoid defeating
- Address management, purchasing managers, manufacturers, sales persons ...
- Enhance communication between machine users and manufacturers
- Prepare trainings of users, operators, manufacturers and inspectors
- Prepare publications
- Create website
 - www.stop-defeating.org
 - with examples for technical solutions

Currently, the website is going online. As shown in Figure 4, it includes general information regarding the subject defeating and addresses specific aspects related to the construction and the use of machines.

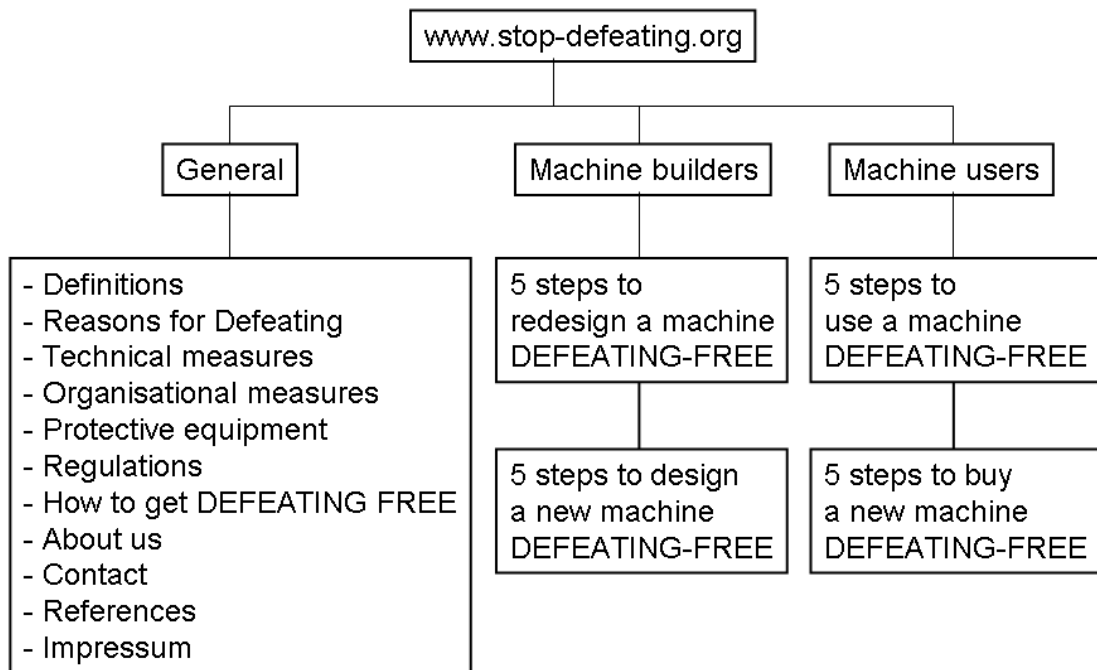


Figure 4: Structure of the website

Examples of good engineering practice are already existing (SUVA) or are under preparation (DGUV) and will be available under stop-defeating.org. It is planned, to offer the content in several languages.

In 2011 a symposium will take place, which addresses machine manufacturers, users and safety-experts. Starting maybe in Italy, a repetition is possible in other countries.

5 WHO SHOULD PARTICIPATE THE PROJECT?

The studies of HVBG, SUVA and BGN show more or less the same results, the amount of defeating safeguards is extensive. So, most probable the situation in other countries is similar and it is worthwhile to spend some effort to reduce the number of accidents caused by defeating. ISSA wants to support this process, but there is still some work to do (see above). Everybody is welcome to help tackling this global challenge, e. g. by:

- Preparing short descriptions (1 – 2 pages) of good machine designs/good methods to apply machines to prevent defeating
- Describe any experience regarding defeating
- Translating existing texts of the website
- Organisation of seminars, symposium
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Any interested person is welcome to contact ISSA, a participating organisation or the author of this article.

6 REFERENCES

- [1] Deutsche Gesetzliche Unfallversicherung (Hrsg.) Report - Manipulation von Schutzeinrichtungen an Maschinen, 2006, Sankt Augustin.
(free download: <http://www.dguv.de/ifa/de/pub/rep/rep05/manipulation/index.jsp>)
- [2] SUVA
<http://www.suva.ch/home/suvapro/branchenfachthemen/schutzeinrichtungen.htm>
- [3] Berufsgenossenschaft Nahrungsmittel und Gaststätten
http://anlagensicherheit.portal.bgn.de/9280/47?wc_lkm=9351
- [4] IFA - Institute for Occupational Safety and Health of the German Social Accident Insurance, Incentive to bypass protective devices, Assessment matrix
(free download: <http://www.dguv.de/ifa/en/prs/manipulation/index.jsp>)

7 WEB-LINKS

Austria

Soziale Unfallversicherung
<http://www.auva.at>

Germany

Berufsgenossenschaft Nahrungsmittel und Gaststätten
<http://www.bgn.de>, shortlink 847

Berufsgenossenschaft Metall Nord Süd
<http://www.bg-metall.de/>

Institut für Arbeitsschutz der Deutschen Gesetzlichen Unfallversicherung (IFA)
<http://www.dguv.de/ifa/de/index.jsp>

Maschinenbau und Metall- Berufsgenossenschaft
<http://www.mmbg.de/>

Italy

Istituto Superiore per la Prevenzione e la Sicurezza del Lavoro
<http://www.ispesl.it/stopdefeating/>

Switzerland

SUVA
<http://www.suva.ch/home/suvapro/branchenfachthemen/schutzeinrichtungen.htm>
<http://www.suva.ch/fr/suvapro/branchenfachthemen/schutzeinrichtungen.htm>
<http://www.suva.ch/it/suvapro/branchenfachthemen/schutzeinrichtungen.htm>