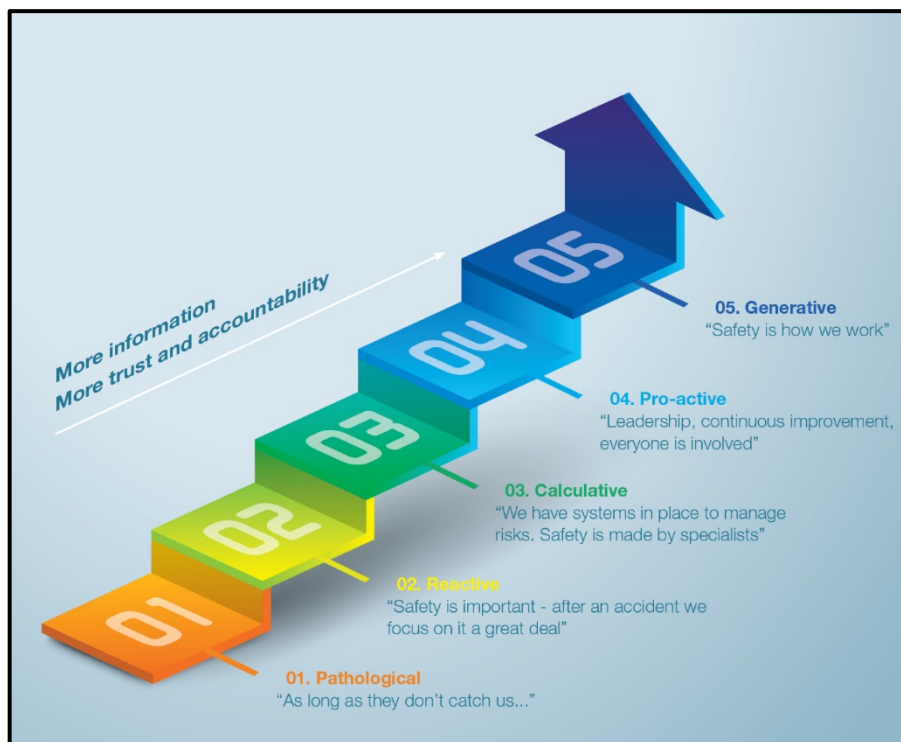


Report

Effects for companies of the implementation of the NEN-Safety Culture Ladder

7 July 2023



Authors:

F. Geijlvoet MSc, TenneT TSO

A.L.J. Zwanikken MSc, SEEFTI Consultancy

F.W. Guldenmund PhD, Delft University of Technology

Content

| | |
|--|-----------|
| 1. Summary | 3 |
| 2. Introduction..... | 4 |
| 3. Problem description | 5 |
| 4. Objectives and (central) research questions | 5 |
| 5. Scope | 5 |
| 6. Methods | 6 |
| 7. Organisation..... | 6 |
| 8. Results..... | 6 |
| 8.1 Reasons for starting with SCL certification | 6 |
| 8.2 The route to certification | 6 |
| 8.3 Positive effects of SCL implementation | 7 |
| 8.4 Negative aspects of SCL implementation..... | 8 |
| 8.5 Suggestions for improvement of the SCL | 9 |
| 9. Conclusions..... | 10 |
| 10. Limitations | 10 |
| 11. Recommendations..... | 11 |
| Annex 1 Interviewed organisations..... | 12 |
| Annex 2 Interview protocol..... | 13 |
| Annex 3 NEN Survey of SCL products | 15 |

1. Summary

The Board of Stakeholders of the NEN for the Safety Culture Ladder (SCL) requested a study into the effects on organisations of working with SCL. The study was carried out by a cooperation of the Delft University of Technology and TenneT TSO. In the period from December 2022 and March 2023, sixteen SCL certified Dutch companies were interviewed. Organisations indicated that implementation of the SCL has positive effects. Most of the companies didn't see a reduction of accidents, but they experienced a higher overall safety awareness, a more open culture to discuss safety issues and better communication between management and shopfloor employees. Critical comments were made about the quality of the audits and the number of audit days. These results are in line with a recent review of SCL products conducted by NEN.

Het College van Belanghebbenden van de NEN voor de Safety Culture Ladder (SCL) heeft een onderzoek laten uitvoeren naar de effecten van het werken met SCL op organisaties. Het onderzoek is uitgevoerd door een samenwerking van de TU Delft en TenneT TSO. In de periode van december 2022 tot maart 2023 zijn vijftien SCL gecertificeerde Nederlandse bedrijven geïnterviewd. Organisaties gaven aan dat implementatie van de SCL positieve effecten heeft. De meerderheid van de bedrijven zag geen vermindering van het aantal ongevallen, maar ervoer wel een hoger algemeen veiligheidsbewustzijn, een meer open cultuur om veiligheidskwesties te bespreken en betere communicatie tussen management en werkvloer. Er werden kritische opmerkingen gemaakt over de kwaliteit van de audits en het aantal auditdagen. Deze resultaten komen overeen met een recente evaluatie van SCL-producten door NEN.

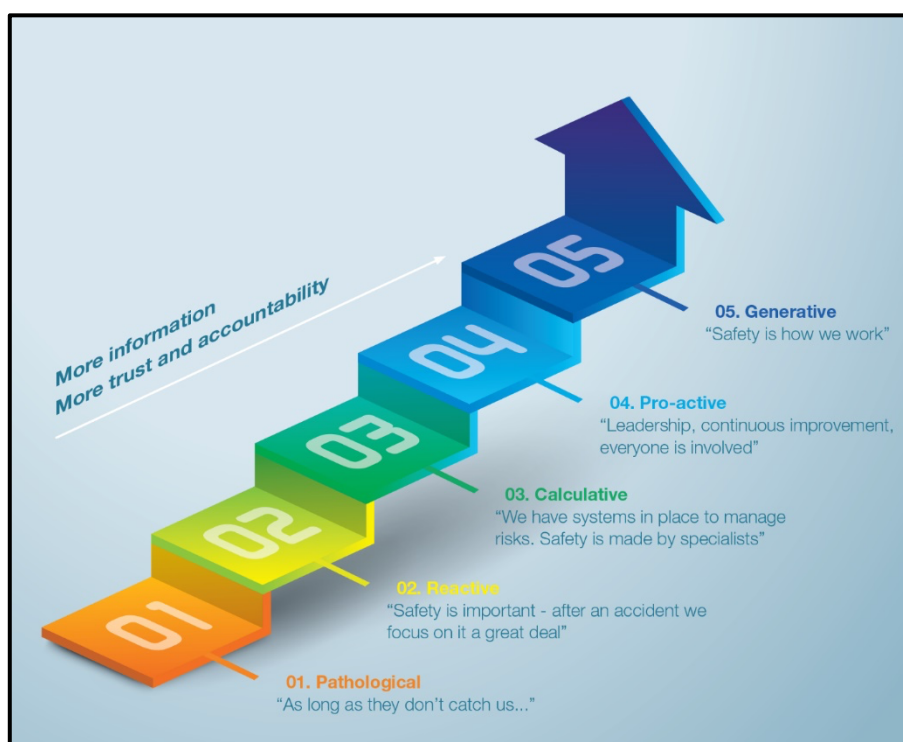
Das Board ob Stakeholders ob NEN vor der Safety Culture Ladder (SCL) gab eine Studie über die Effekte der Arbeit mit SCL auf Organisationen in Auftrag. Die Studie wurde in Zusammenarbeit zwischen der Technischen Universität Delft und TenneT TSO durchgeführt. Im Zeitraum von Dezember 2022 bis März 2023 wurden fünfzehn SCL-zertifizierte niederländische Unternehmen befragt. Die Unternehmen gaben an, dass die Umsetzung des SCL positive Auswirkungen hat. Die Mehrheit der Unternehmen konnte keine Verringerung der Unfallzahlen feststellen, aber sie erlebten ein höheres allgemeines Sicherheitsbewusstsein, eine offenere Diskussionskultur zu Sicherheitsfragen und eine bessere Kommunikation zwischen Management und Belegschaft. Kritische Anmerkungen gab es zur Qualität der Audits und zur Anzahl der Audittage. Diese Ergebnisse stehen im Einklang mit einer kürzlich vom NEN durchgeführten Evaluierung von SCL-Produkten.

2. Introduction

The Safety Culture Ladder (SCL) was developed in 2011 by the Dutch railway manager ProRail, with the aim to improve occupational safety on and around railways. ProRail uses this tool to distinguish contractors in terms of the safety attitude and behaviour of their staff and for selecting contractors.

The SCL distinguishes five levels or steps. The ladder steps indicate the level of maturity of a company in terms of safety awareness and safety culture. The five steps are indicated in the figure 1 below.

Figure 1: The Safety Culture Ladder maturity levels



In 2016, ownership of the ProRail SCL system was transferred to the Dutch standardisation institute NEN. Since 2019, TenneT, the operator of the Dutch and part of the German high voltage transmission system, requires its contractors to be SCL certified, for the same reasons as ProRail.

Since 2022, clients who have signed the Dutch Governance Code of Safety in Construction are asked to include safety awareness as an obligation in tenders and contracts, meaning that contractors need to be SCL certified.

In May 2023, a total of 1.774 SCL certificates/statements/self-assessments were issued, of which 1.436 in the Netherlands, 136 in Germany, 21 in Belgium and 281 in other countries.

The question arises, what efforts organisations make to become SCL certified and what the measurable or perceived effects are on occupational safety. This study aims to answer the above questions. The study was commissioned by the Board of Stakeholders of SCL and carried out by a team of independent researchers. The results of this study are presented in this report.

3. Problem description

An increasing number of organisations implement the SCL, partly because of internal motivation, but more often because of requirements of their clients and other stakeholders. This puts pressure on these organisations. Efforts have to be made to meet the SCL requirements, resources have to be made available and costs are involved in external certification.

The question arises whether the obligation to be SCL certified is justifiable in relation to the costs and efforts on the one hand and the resulting improvement in safety on the other hand.

The NEN, together with TenneT, initiated a study on the effects of the implementation of the SCL, realising the impact of the SCL requirements for contractors, and would like to evaluate the effects of the implementation of the SCL at their contractors. NEN started a cooperation with TenneT, Delft University of Technology, to evaluate the effects of the implementation of the SCL.

The aim of this study is to know more in depth if the idea that the SCL has positive effects is true and what has changed within the contractor companies and what perceived effects the SCL has on safety management and safety performance.

4. Objectives and (central) research questions

The main objective of this study is to evaluate the added value of the implementation of the SCL for contractors being certified on Level 3 (or higher) of the SCL.

The main questions are:

1. What have contractors done to implement the SCL requirements?
2. What effects on safety do the contractors identify?
3. What effects are visible on safety performances of the contractors?
4. How do contractors value the SCL efforts? Was it worth it? What has made the difference?
5. Are there differences between companies certified on Level 3, and companies certified on Level 4/5, and if so, which differences?

5. Scope

The main focus of this study is on TenneT contractors, although ProRail contractors have a longer experience with the SCL. The main reason is accessibility of these contractors for the researchers. We have only included Dutch contractors. As many of these companies work for other clients as well like ProRail or Rijkswaterstaat, the results are expected to be valid for all SCL certified companies, as we expect that working for TenneT is not a determining factor in the companies' endeavours to meet SCL requirements.

Parallel to this research we initiated similar research in Germany in cooperation with the Fachhochschule in Munster. In a later stage we will combine the Dutch and German results in an integrated update.

6. Methods

For this study, sixteen SCL certified organisations (SCL and SCL original¹) have been selected randomly. Each time two research team members interviewed the person(s) responsible for Health and Safety about the company's safety initiatives using a semi-structured interview protocol². The interview reports were coded and analysed using ATLAS.ti, a tool for qualitative data analysis.

The study was carried out in the period December 2022 – May 2023.

The results of the study were cross checked against the results of an evaluation survey of SCL products conducted by the NEN in 2023, which was kindly provided to us by the NEN.

7. Organisation

The study was conducted by a team of independent researchers:

- Frank Guldenmund PhD, assistant professor at the Safety Science & Security Group at Delft University of Technology, Netherlands.
- Frans Geijlvoet MSc, HSE strategy advisor at TenneT TSO in Arnhem, Netherlands.
- Sander Zwanikken MSc, owner of SEEFTI Consultancy in Nijmegen, Netherlands.

8. Results

8.1 Reasons for starting with SCL certification

Most organisations start using SCL because their clients require it (e.g. ProRail, TenneT, ViA). Certification was a prerequisite for obtaining client contracts. Only one of the interviewed organisations remarked explicitly that they started with the implementation of SCL because of internal reasons, viz. to raise their personnel's safety awareness to reduce the number of accidents.

These findings are partly supported by the survey carried out by NEN. In this survey, a majority of the respondents indicated they started with SCL because of competitive reasons.

8.2 The route to certification

Several of the interviewed organisations started their route to SCL certification by gathering more information about SCL by attending information meetings organized by the NEN or TenneT, or by visiting peer companies. In many cases, this was followed by performing a gap analysis or self-

¹ See <https://safetycultureladder.com/en/the-safety-culture-ladder/the-safety-culture-ladder-products/>

² See Annex 1

assessment (by using the NEN webtool or the use of another, often self-developed method). Some organisations have called in external experts to guide them during this process.

A wide variety of initiatives were implemented. Recurring topics are leadership trainings, sanctioning and rewarding instruments, introduction of LMRA (Last Minute Risk Analysis), the organisation of yearly safety days as well as thematic campaigns, safety observation rounds and site visits by management with or without observation cards.

Other initiatives mentioned are management trainings, awareness trainings on the shopfloor, promoting the reporting of safety incidents, creating a risk register for projects, setting up a committee for safety improvements, trainings for speaking up (the so-called 'safety voice') and trainings for risk recognition/awareness.

8.3 Positive effects of SCL implementation

The interviewees mentioned several positive effects, more and less concrete. Effects which are recurrently mentioned are:

Consolidation or strengthening of market position

Interviewees mentioned that SCL certification is not only a necessary requirement for getting contracts of clients they work for, but also that it is a distinct selling point to demonstrate safety performance in addition to ISO 45001 and SCC (VCA), as not every client requires SCL certification. Some interviewees indicate that safe working methods, instigated by SCL, lead to lower costs and higher efficiency.

Safety dialogue

Interviewees mention that they experience more and more meaningful dialogues between management and the shopfloor regarding safety, making bottom-up speaking up for safety easier and creating an overall better mutual understanding.

Contractors and clients are moving from a more Client-Contractor relation towards more collaboration and partnership in improving safety because they are more in dialogue during all project stages. Contractors start addressing safety issues with the client, leading to a safer working environment.

Companies also indicate a more proactive exchange of safety information between contractors and subcontractors, e.g., lessons learned from accidents.

Safety awareness

All companies perceive an increased level of safety awareness due to the SCL initiatives they implemented and due to increased communication about safety within the company.

Incidents and accidents

Most companies indicate that the number of incident reports has increased, not implying that the actual number of accidents has increased; in most cases the willingness to report non-injury incidents has increased.

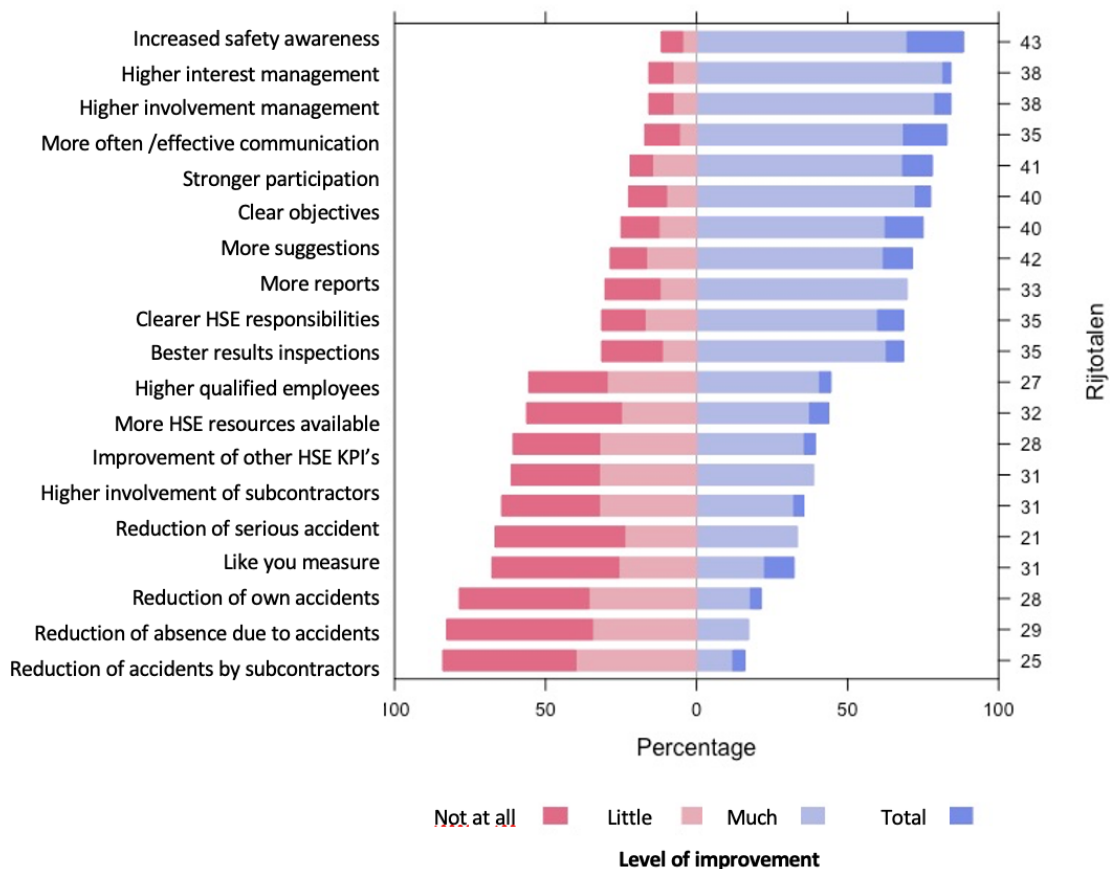
Two of the interviewees mention a decrease of accidents with injury, apparently due to implementation of the SCL. One company also claims a decrease of the absentee rate.

Driver for improvement

The implementation of te SCL is seen as a main driver for continuous improvement, mainly caused by the aspects mentioned above. Circa half of the interviewees indicate that they plan to achieve a higher certification step of the safety culture ladder in the future.

The NEN Safety Culture Ladder survey finds consistent effects of the implementation of the safety culture ladder. In the figure 2 below an overview is presented of how many respondents see improvements on several aspects (blue) and an overview of aspect where no improvements are found (Red).

Figure 2: positive impact of implementation of SCL, level 3 NEN Safety Culture Ladder survey



8.4 Negative aspects of SCL implementation

Time and costs

Most interviewees indicate that the time and costs involved in SCL certification are (too) high. This is mainly caused by the required audit days and the fact that audit interviews are always done by two auditors. Also, the difference between step 3 and 4 is an increase of 25% in audit days. Interviewees

think this intensification has little added value. Interviewees indicate that the SCL audit is the most expensive audit compared with other audits such as SCC (VCA) or ISO.

The NEN survey offers a more nuanced view. A significant portion of the respondents indicates that the audit time is appropriate.

For companies, mainly those with a low number of projects, the persistent pressure of site visits, both internally (e.g. safety walks and workplace inspections) and external site visits (audit) is high.

Quality of auditors and Certification Institutes

Half of the interviewees thinks that the quality of the auditors is not consistent. Some of the companies have changed auditors or Certification Institute for that reason. Interviewees frequently indicate that the interpretation of SCL requirements differs between auditors, (examples: what exactly is a behavioural audit and what is considered sufficient positive rewarding)

Secondly, interviewees experience that some auditors don't approach the audit from a cultural viewpoint, but rather have a more 'classic' system audit approach.

In some cases, companies indicate that the auditor lacks interview skills, which sometimes leads to a socially unsafe environment.

Specific SCL requirements

Companies indicate that definitions of terminology are not clear and open to multiple interpretations. Examples:

- Definition of behavioural audits;
- Definition of how to reward employees;
- Cost/benefit analysis;
- Definition of safety expert;
- Definitions of directors, management, and employees.

Interviewees argue that the SCL scheme is primarily written for operational (construction and infrastructure) companies. The SCL seems less applicable to supporting companies (e.g. engineering bureaus and other companies). It is unclear how to apply some of the SCL requirements to these companies.

Ladder steps

The SCL steps seem to indicate that Level 5 is the highest achievable level. Some companies suggest that this should be a level which cannot be achieved. One company suggested an unattainable level 6. Another company suggested to delete both Level 1 and 2.

8.5 Suggestions for improvement of the SCL

Finally, interviewees put forward multiple improvements:

- Clients requiring their contractors to be SCL certified should also be SCL certified, as is the case in ViA³;

³ Safety in Procurement, part of the Governance Code Safety in Construction, see: <https://gc-veiligheid.nl/tools/veiligheid-in-aanbesteding-via>

- One interviewee indicates that a company's SCL-level should weigh more heavily in the selection process. Usually, cost is now the most important decision factor;
- Some interviewees would like to have a support tool for assessing their (often small) subcontractors;
- Companies suggest simplifying the range of SCL products. At the moment, there are four different variants (SCL Original, SCL, SCL Light and Approved Self-Assessment);
- The standard should also include work pressure specifically (psychosocial factors);
- The SCL standard should include more requirements for project preparation.

9. Conclusions

In general, interviewees are positive about the SCL. Only a small proportion of the interviewees indicate a decline in incidents, but this is not recognized by most of the interviewees. It is therefore fair to conclude that SCL certification does not automatically leads to a decline in incidents and accidents.

The majority of interviewees indicate that SCL has a perceived positive influence on the safety culture of their organisation. All levels in the organisation seem to become more safety aware, and safety has become a topic which is discussed at all levels, especially between management and shopfloor.

SCL has triggered most organisations to implement a wide variety of new instruments for safety management. Therefore, we conclude in general that most parties are convinced that implementation of the Safety Culture Ladder has added value and leads to a higher safety performance of the organisation.

The above results are largely supported by the survey carried out by NEN for an evaluation of the SCL products (see annex 3).

Critical remarks were most frequently made on the duration of the audit, leading to relatively high costs compared with 'regular' ISO audits. Also, the quality of auditors was commented upon by circa half of the interviewees, making the audit much dependent on the personal qualities and interpretations of the SCL requirements of the auditor.

10. Limitations

This study is based on sixteen interviews, of Level 3 and higher certified companies, which is a small number in relation to the total number of certified organisations. Although the nature, size and certification level and time of being certified of the organisations was diverse, still a unified picture emerged. Compared with the results of a recent survey by NEN (Evaluation of SCL-products), the results of the present study are comparable. Some differences can be attributed to chance, due to the limited sample on which this study is based.

11. Recommendations

The NEN has developed an update of the SCL, which will be released later this year (2023). We expect that some of the problems mentioned with the current SCL will be solved but it is interesting to monitor and evaluate the new scheme after one or two years. Furthermore, it is important to verify regularly if the new release still leads to the positive effects of the previous release.

We further recommend the NEN and its stakeholders to critically evaluate the so called man-day table and determine how audit pressure can be reduced. While companies do not experience much added value after several audit days, maintaining the current regime might lead to a decrease in the acceptance of the scheme in the long run. Importantly, reducing the number of audit days also calls for high quality authors who can carry out the audit equally reliable in less days.

Annex 1 Interviewed organisations

| | Type of activity | Company size (employees) | SCL step |
|----|---|--------------------------|----------|
| 1 | Demolition | 15 | 3 |
| 2 | Construction of utility projects | 400 | 4 |
| 3 | Real estate agencies | 2,900 | - |
| 4 | Other specialised construction activities | 6,000 | 3 |
| 5 | Technical testing and analysis | 80 | 3 |
| 6 | Electrical, plumbing and other construction installation activities | 450 | 4 |
| 7 | Construction of utility projects | 190 | 4 |
| 8 | Construction of utility projects | 2,300 | 5 |
| 9 | Landscape service activities | 2,000 | 4 |
| 10 | Engineering activities and related technical consultancy | 1,000 | 5 |
| 11 | Electrical, plumbing and other construction installation activities | 55 | 4 |
| 12 | Engineering activities and related technical consultancy | 1,900 | |
| 13 | Electrical, plumbing and other construction installation activities | 6,000 | |
| 14 | Other specialised construction activities | 50 | 3 |
| 15 | Other specialised construction activities | 18 | 3 |
| 16 | Activities of professional membership organizations | n.a. | n.a. |

Annex 2 Interview protocol

1. For what reason(s) was the choice made to obtain an SCL certificate?

Which reason was most important? Who suggested this idea? If for client, which one?

2. Is the level achieved also the intended level?

Were there any doubts beforehand? Why was the intended level not achieved?

3. Does the organisation want to move to a higher level in the future?

Why / why not? Which level? What needs to be done to reach the higher level? Is the ultimate goal level 5?

4. What has the company done to become certified?

What steps were taken, and why? Who was responsible for it? How was the audit communicated to employees/how were employees prepared?

5. What have you found to be the most difficult challenge in the process of implementing the SCL?

6. What changes have occurred as a direct result of the organisation being SCL certified?

Per aspect: Why has this changed, what is the purpose of this change? Which individuals within the organisation are affected by this? What were needed for this change? Is this change still being implemented in this way?

Business aspect 1: Leadership and commitment (management interest, employee engagement, performance reward

Business aspect 2: Policy and strategy (accident causation, profitability and continuity)

Business aspect 3: Organisation and contractors (contractors, competence and training, H&S department)

Business aspect 4: Workplace and procedures (work planning, workplace safety, procedures)

Business aspect 5: Deviations and communication (incident reporting, incident investigation, incident follow-up, daily monitoring, meetings)

Business aspect 6: Audits and statistics (audits and reviews, trends and statistics)

7. Has the implementation of the SCL helped improve staff attitudes and behaviour towards safety?

How: are more workers now involved in work safety? Are workers more involved in work safety? Is it still helping now

8. What has the SCL brought to the organisation?

Did the organisation learn anything from it? Blind spots uncovered?

9. Can specific triggers be identified for the SCL, does it depend on those triggers, or not

10. Does SCL lead to better safety performance, and how does the organisation know or measure it?

11. What are important indicators of safety for the company and to whom are they reported/to whom are they communicated?

12. What are the main downsides of the SCL for the organisation?

13. What are the main benefits of the SCL for the organisation?

14. Are there issues / aspects missing in the SCL standard, which are, however, relevant to judge the safety culture in an organisation?

Why do you think this is relevant to culture?

15. Are there things in the SCL standard, which you think are not relevant to judge the safety culture in an organisation?

Why is this irrelevant?

16. What added value does the audit bring to the organisation?

These were our questions. Are there things not covered that you would still like to discuss? Or do you still have questions?

Annex 3 NEN Survey of SCL products

In the NEN Survey of SCL products (2023), the following question was asked about the effects of working with the SCL: “Since the introduction/certification of the Safety Ladder, have you been able to achieve the following health and safety improvements?”

For triangulation purposes with this study, the response was analysed for organisations being certified on SCL and SCL original level 3. The results are shown in the graph below.

Figure: positive impact of implementation of SCL, level 3 NEN Safety Culture Ladder survey

