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METHOD, SYSTEM AND APPARATUS FOR ASSESSING WORKPLACE SAFETY

TECHNICAL FIELD

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The present invention relates to methods, systems and apparatus for assessing safety and in particular for assessing workplace safety.

BACKGROUND ART

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Many workplace sites, including construction and manufacturing sites, oil drilling rigs and so on involve the use of equipment, tools and machinery to be operated by several workplace personnel, or "workers". Such workplace environments involve potential safety issues relating to correct use of equipment, tools and machinery by workers, and correct equipment maintenance, to prevent injury to workers.

Several companies have devised systems to assess and audit the safety of workplaces to prevent accidents and injury to workers. An example of one system is the "Safety Training Observation Program", or "STOPTM" by E. I. du Pont de Nemours and Company (DuPont). STOPTM involves training workers to carry out daily audits of their workplace using a standard "observation checklist" questionnaire which may be filled out by a worker. By answering the questions, the worker carries out a safety audit of the workplace. The questions may be adapted to suit the specific equipment and environment of the workplace in question, however they include questions relating to reactions of people to specified situations, use of specified personal protective equipment, positions/locations of workers in relation to machinery, whether tools and equipment being used for a particular purpose are appropriate for that purpose, whether correct procedures are being followed, etc. The results of questionnaires filled out by several workers are then collated for later reporting and, where applicable, action for improving workplace safety.

SUMMARY OF THE INVENTION

According to a first aspect of the invention there is provided a method for assessing workplace safety comprising the step of assessing whether one or more
5 workers adhere to predetermined worker safety procedures, wherein the worker safety assessment step is performed separately to at least one other workplace safety assessment step.

Optionally, the at least one other assessment step comprises assessing whether one or more items of workplace equipment adhere to one or more predetermined
10 equipment safety parameters.

It has been recognised that the general population can generally be divided into two personality-types – people who are predominantly task-focussed and people who are predominantly people-focussed. Furthermore, whether a person is task-focussed or people-focussed will influence him in assessing a workplace for potential safety
15 issues. For instance, people who are predominantly task-focussed tend to concentrate on issues related to equipment, while people who are predominantly people-focussed tend to concentrate on issues related to workers and how they are performing their work. The invention therefore addresses this issue by separating the assessment of workplace safety by providing a method where equipment safety is assessed separately
20 to people safety. The applicant has found that this approach may help to reduce bias in workplace safety assessment. This is by ensuring people of either said focus apply balance between people safety issues and equipment safety issues when assessing workplace safety.

Optionally, the step of assessing worker safety comprises recording related
25 information on a first data recorder and/or the other assessment step comprises recording related information on a second data recorder.

Optionally, prior to the assessment steps, the method comprises the step of assessing personality-type of at least one of the one or more workers and/or a worker performing the method.

30 Optionally, the method comprises step of providing indicia to the at least one of the one or more workers assessed for personality-type, the indicia being visibly

locatable on and relating to the personality-type of the corresponding assessed worker(s).

Optionally, the step of assessing worker safety comprises recording on the first data recorder one or more indicia regarding the personality-type of a worker carrying
5 out the worker safety assessment step. The step of assessing equipment safety comprises recording on the second data recorder one or more indicia regarding the personality-type of a worker carrying out the equipment safety assessment step. Optionally, the step of assessing worker safety comprises recording on the first data recorder one or more indicia regarding the personality-type of one or more of the
10 workers whose procedural safety is being assessed. The method may further comprise the step of processing the acquired worker safety data to determine whether a set of workers having the same or similar personality-type work more or less safely than a set of workers having a different personality-type.

The first and second data recorders may be machine readable. Optionally, the
15 method comprises the step of acquiring data from the first and second data recorders for processing by a computer processing device.

Optionally, the method is performed by a plurality of workers, each worker recording data relating to worker safety assessment on a respective one of the first data recorder and recording data relating to equipment safety assessment on a
20 respective one of the second data recorder. The method may further comprise the step of processing the acquired data to provide results weighted by one or more of the personality-types of the workers who recorded the data.

Optionally, the personality-types may include one or more task orientated worker personality-types and one or more people orientated worker personality-types.
25 By assessing whether workers are task-focussed or people-focussed, the data collected by the person in question can be assessed in light of this knowledge to further reduce any bias from the person collecting the data toward equipment safety issues or people safety issues.

Optionally, the worker personality-types may include one or more task
30 orientated worker personality-types and one or more people orientated worker personality-types. The task orientated worker personality-types may include director

personality-type and conscientious personality-type and the people orientated personality types include influencer personality-type and steady personality-type.

The personality-type data may also be used to determine whether workers of one personality-type are more or less likely not to follow correct workplace safety procedures than workers of a different personality-type. This may help in training of workers, where workers of one particular personality-type are trained differently, with different emphasis on determined workplace safety procedural matters than workers of a different personality-type. This may further reduce incidences of breaches of workplace safety.

10 According to another aspect of the invention there is provided a system for assessing workplace safety comprising:

a first data recorder configured for recording results of whether one or more workers adhere to predetermined safety procedures; and

15 a second data recorder configured for recording results of assessing other workplace safety information.

The system may comprise features embodying the optionally and preferred features of the above described method aspect.

The system may further comprise a computer processing device configured to acquire data from the first and second data recorders for processing. The computer processing device may comprise a scanner for scanning the first and second data recorders. A computer processing device may also be configured to process the acquired data to provide results weighted by one or more of the personality-types of the workers who recorded the data. The computer processing device may be configured to process the acquired worker safety data from a plurality of first data recorders to compare the worker safety data of a first set of workers having the same or similar personality-type with the worker safety data of a second set of workers having a personality-type different to the first set of workers.

The first and second data recorders may comprise respective data cards for manually recording data.

30 According to another aspect of the invention there is provided a set of workplace safety data recorders comprising:

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at least one first data recorder configured for recording data relating to the assessment of whether one or more workers adhere to predetermined safety procedures; and

at least one second data recorder configured for recording data relating to
5 another workplace safety assessment.

The second data recorder may be configured for recording data relating to the assessment of whether one or more items of workplace equipment adhere to one or more predetermined equipment safety parameters. The first and second data recorders may be machine readable. Optionally, the first and second data recorders may be
10 respective first and second cards configured for the manual recording of information thereon.

According to another aspect of the invention there is provided a computer program or a computer program product, stored on a computer readable medium, configured to cause a computer to process and/or analyse the information recorded on
15 the first and/or second data recorders referred to above in relation to the above described method aspect.

BRIEF DESCRIPTION OF THE DRAWINGS

20 Preferred embodiments of the invention will now be described, by way of example only, with reference to the accompanying drawings in which:

Figures 1a to 1c are flow diagrams of steps of an embodiment;

Figures 2a and 2b are schematic diagrams of an embodiment of data cards; and

Figure 3 is a schematic diagram of an embodiment of a computer system.
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DETAILED DESCRIPTION OF THE PREFERRED EMBODIMENTS

A preferred embodiment comprises a method and system for assessing workplace safety for helping an organisation reduce or prevent workplace accidents
30 and injury, and downtime associated therewith. The method and system is particularly useful in work environments where heavy machinery is operated, such as in a

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manufacturing plant or on an oil platform, and where there are several workers who may or may not work in shifts. It is important and good workplace practice in such environments to ensure a formalised safety assessment program is in place to reduce and prevent workplace injury and accidents. The preferred embodiments make use of
5 the above mentioned inventive realisation that workplace safety can be better assessed and managed if different personalities of workers are acknowledged and utilised in assessing workplace safety and in using the assessment results to improve workplace safety.

Referring to Figures 1a to 1c, the preferred method comprises three main
10 stages, each shown schematically joined in Figures 1a to 1c by dotted lines. Firstly, referring to Figure 1a, at least some and preferably all workers are assessed 100 for their personality-type using a personality indicator test. Personality indicator tests which could be used with the preferred method include such tests as those based on, or influenced by, either wholly or in part, known Jungian personality types (“thinking,
15 feeling, sensing and intuiting”). One example of such tests includes the applicant’s “E-Colours” personality test which attempts to predict a person’s behaviour depending on different situations. The test is used to determine the weighting of an individual’s personality in terms of four personality traits: *director* – doer, direct communicator who is task orientated; *influencer* – talker, sociable and people
20 orientated; *supportive* – guardian, team player and people orientated; and *analytical* – thinker, detailed and task orientated. The applicant has determined that most people will have a dominant pair of personality traits, typically being either the pair of director and analytical (indicating a “task-orientated” personality), and the pair of influencer and supportive (indicating a “people-orientated” personality). Each of the
25 assessed workers is given indicia in the form of a marked label to locate visibly on their person, such as on their hardhat, or shoulder, so that their co-workers can see the label. In this embodiment, the markings on the label include two colours: a first colour to indicate the worker’s predominant personality trait; and a second colour to indicate the worker’s second dominant personality trait. For most, if not all workers,
30 their label will include colours indicating either the pair of task-based personality traits or colours indicating the pair of people-based personality traits. As will become

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more evident in the following description, this embodiment utilises the knowledge of the worker's personality traits and the indicators in assessing and improving workplace safety. Also, as will be understood, in an alternative embodiment, indicia other than colour may be used to indicate personality traits, for example, unique
5 symbols, alphanumeric symbols, etc may be used. Also, alternatively, in place of two colours, the label may only comprise one colour (or other indicia) to indicate the worker is task-orientated and one colour (or other indicia) to indicate the worker is people-orientated.

Once workers have been assessed for their personality traits, they are trained
10 102 in how to use the method of the present embodiment. Referring to Figures 2a and 2b, this involves training workers how to use a first data recorder in the form of a first data card 104 for recording data regarding worker safety in terms of workers' adherence to safety procedures, and how to use a second data recorder in the form of a second data card 106 for recording data regarding equipment safety. In this
15 embodiment, the first data card 104 is arranged in three sections: a first section 108 relating to the worker carrying out the assessment; a second section 110 regarding the personality of the primary worker being assessed; and a third section 112 with questions relating to predetermined worker safety procedures. The first section 108 includes data recording space for the assessing worker to record details such as their
20 name, personality type (in the form of their two predominant colours), location and the time of day. The second section 110 provides space for recording the personality of the primary of their co-workers they are assessing (for example, a group of co-workers may be performing a task: only one or a representative one of the group will be considered in completing the card 104). As each worker wears a visible label on
25 their person indicating their personality-type, this facilitates the recording of the primary worker's personality-type on the first data card 104. In this embodiment, the four letters in the second section 110 relate to colours which indicate the above four mentioned personality types. "R" represents red, as an indicator of the "Director" personality type. "Y" represents yellow, as an indicator of the "Influencer"
30 personality type. "B" represents blue, as an indicator of the "Supportive" personality type. "G" represents green, as an indicator of the "Analytical" personality type. The

third section **112** comprises several questions regarding how the workers being observed could get hurt, depending on their current work practice. For those questions provided in the third section **112** which require a positive response, the worker assessing the worker safety marks the relevant circle to indicate there is a safety problem or potential safety problem. As will be understood, more or fewer questions may be included on the first data card **104**. In this embodiment, the second data card **106** comprises an equivalent first section **114** to the first section **108** on the first data card **104** and a second section **116** comprising questions relating to the safety or otherwise of equipment and tools. In the embodiment illustrated in Figure 2b, eight questions are provided (four actual questions are provided in the illustrated example, with symbols ">>>>" given to illustrate space for four additional questions) for a worker assessing worker safety to record the safety or otherwise of either items of equipment or tools. As will be understood, more or fewer questions may be provided in the second section **116** of the card **106**.

Referring to Figure 1b, a worker equipped with a set of first and second data cards **104**, **106**, who is also trained **102** in how to use the cards, can assess, separately, the workplace safety of their co-workers in terms of how they are carrying out predetermined worker safety procedures and in terms of whether equipment and/or tools meet predetermined safety parameter requirements. The assessment is carried out by the worker in question by observing **118** worker workplace practice and following and recording **120** responses to the questions on the first data card **104**. Once the worker has responded to as many questions on the first card **104** as relevant, he then observes **122** the workplace equipment and tools and, following the questions on the second data card **106**, records **124** relevant data on the second data card. As will be understood, the worker may observe either the worker workplace practice **118** prior to observing equipment safety **122**, or vice versa.

By having separate first and second data cards **104**, **106**, the worker performing the workplace safety assessment is forced to separate his consideration of worker adherence to safety procedures and of safety of equipment. As explained above, given the natural bias of task-orientated people toward consideration of equipment safety and of people-orientated people toward the way people perform their

work, this separation helps to reduce bias by workers when performing workplace safety assessments.

Once observations are made on either equipment **118** and/or people **122**, the observer using either the first data card **104** or the second data card **106** may have a
5 safety conversation **125** with the co-worker(s) being observed in relation to the first data card **104** to discuss both safe and unsafe observations, or he may have a safety conversation **126** with co-workers responsible for the equipment which is the subject of the second data card **106**.

Once the worker has completed his assessment of worker workplace practice
10 and equipment safety, he gives **127, 128** his completed cards **104, 106** to a designated authorised co-worker. As will be understood, more than one or all workers in a given workplace may perform the above described method at regular or ad hoc time intervals, as determined by the employer of the workers.

The collected cards are singly or batch scanned **130** by a standard optical
15 scanning device **132a,b,c** (which see Figure 3) to a computer **134a,b,c**. Software on the computer **134** determines responses to the questions, since the cards **104, 106** are in a format wherein a software program, written with the cards **104, 106** and question format in mind, determines the responses to the questions. In one embodiment, optical character recognition (OCR) software is also used to determine the respective
20 worker's names and personality types written on the cards **104, 106**. An image of each card is held in the computer's memory for later recollection. The data determined by the software, after the scanning of the cards, is then uploaded **136** via a network, such as a local area network (LAN), wide area network (WAN), the internet **137**, or other network to a central server **138**. In an embodiment where the first and
25 second cards **104, 106** are double sided, the scanner may be configured to scan both sides of the cards at once to reduce manual input and time taken to scan the cards.

As will be understood, the above described method and system may be implemented at several workplace locations of an organisation. Therefore, it may be useful to be able to upload the data determined from the scanning process to a central
30 server or computer **138** belonging to the organisation to centrally assess the workplace safety of their organisation as a whole, or workplace by workplace, for example.

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Referring to Figure 1c, the uploaded data is then processed **140** by the central computer **138**. The processing provided by software includes the providing of collected responses to each question, which may then be provided to a user, such as a manager of the organisation, in the form of a table or graph, as desired. From this, the user can review **142** the data relating to the workplace safety of his workers based on procedural adherence by workers and on equipment. Furthermore, the software is configured to allow the user to review portions of the data, such as the compiled data recorded by all workers having the same personality-type. In this way, the user can identify if one personality-type group is more aware of some workplace safety issues than their co-workers. Also, the software is configured to allow the user to review collated equipment data and collated worker procedural safety data for each location to determine whether one location has more or less potential for an accident or worker injury in terms of equipment safety and/or worker procedural safety. Once the data has been reviewed **142** by the user, feedback **144** can be given to one or more or each location of the organisation for improving the safety at those locations, and improvements noted for action and tracked for implementation **145**. As will be understood, the steps exemplified in Figure 1b will continue to take place independently of the steps exemplified in Figures 1a and 1c. Once feedback **144** has been implemented, it will then be possible for the user to monitor the impact of the feedback or of the actioned improvements through the processing **140** and review **142** of data collected through the steps in Figure 1b after feedback implementation.

The steps illustrated in Figure 1c have been briefly described in terms of a computer system including a scanner, computer and internet uplink to a central computer for processing of scanned data. Referring to Figure 3, this may be achieved in several ways. Firstly, for example where the organisation has one workplace, the scanner and computer may be stand-alone, as illustrated by scanner **132a** and computer **134a**. In this case, the computer **134a** itself will contain the software for processing **140** the scanned data for later review **142** by the user. Alternatively, as illustrated by scanners **132b,c** and computers **134b,c**, the organisation may comprise a first location with one scanner **132b** and computer **134b** combination connected through the internet **137** to a central computer **138** for data processing **140**, etc. At

another location, there may be more than one scanner **132c** and associated computer **134c** connected via a LAN or WAN to a local central server computer **146** which is in turn connected via the internet **137** to a central server computer **138**. In this embodiment, the data processing **140** may be performed by one or more of the

5 computers **134c**, the local central server computer **146** or the central server computer **138**, depending on the desired outcome of the organisation. For example, where a user at one location (such as the location served by computer **134b**) wishes to review **142** processed data for his location, it may be useful for the data to be processed at his location. If desired, the processed data may then also be uploaded to the central

10 computer server **138**, for review **142** by another user in the organisation. As will be understood, other known computer network configurations may be used for the process, review, upload or download of raw scanned data or processed data, depending on the needs of the organisation.

In an alternative embodiment as an addition to the above described process

15 **140** and review **142** steps, the software may be configured to weight the collated recorded data depending on the personality-type of the workers having recorded the data. In this way, more weight can be applied to equipment safety data recorded by task-orientated personality-type workers, and more weight can be applied to worker procedural adherence safety data recorded by people-orientated personality-type

20 workers.

In another embodiment as an addition to the above described process **140** and review **142** steps, the data from the first card **104** can be processed by the computer **138** to determine whether workers of a particular personality-type appear to be more or less safe than their colleagues in terms of adherence to safety practices. This

25 information can allow for the training step **102** can be tailored for each personality-type. This may help to influence workers' adherence to workplace safety practices.

Another embodiment comprises a set of first and second cards **104**, **106**, comprising the features described above, wherein the set is preferably containable in a card wallet. The set may be used in conjunction with the above described method and

30 system embodiments. The card wallet is arranged to hold a plurality of the first cards **104** together and a plurality of the second cards **106** together, separately from the

plurality of first cards **104**. The set is provided in a convenient size to be carried by a worker at their workplace to allow for easy and at least partially protected carrying of the first and second cards **104, 106** by the worker.

5 The use of labels to display the personality types of workers has an added benefit in reducing adverse safety incidents in the workplace. As an optional addition to the step of training workers **102**, the workers can also be trained in how to interact with their colleagues dependent on their co-workers' personality-types. This can be particularly helpful when having the safety conversation **125** mentioned above with co-workers in relation to how they are performing their work, or when having a safety
10 conversation **126** mentioned above with co-workers who are responsible for equipment. With knowledge of their co-worker's personality-type, they can approach their co-worker in a manner that is either less likely to offend or upset their co-worker, and/or in a manner which is likely to achieve a positive result in improving their co-worker's adherence to workplace safety practice.

15 As will be understood, while the present embodiment is particularly useful for and described in relation to the above mentioned work environments, it is also applicable to other work environments, including office work environments, storing and packing environments, and so on.

20 While the invention has been described in reference to its preferred embodiments, it is to be understood that the words which have been used are words of description rather than limitation and that changes may be made to the invention without departing from its scope as defined by the appended claims.

THE CLAIMS DEFINING THE INVENTION ARE AS FOLLOWS:-

1. A method for assessing workplace safety comprising the step of assessing whether one or more workers adhere to predetermined worker safety
5 procedures, wherein the worker safety assessment step is performed separately to at least one other workplace safety assessment step.
2. The method of claim 1, wherein the at least one other assessment step comprises assessing whether one or more items of workplace equipment adhere to one
10 or more predetermined equipment safety parameters.
3. The method of claim 1 or 2, wherein the step of assessing worker safety comprises recording related information on a first data recorder and/or the other assessment step comprises recording related information on a second data recorder.
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4. The method of claim 3, comprising the step, prior to the assessment steps, of assessing personality-type of at least one of the one or more workers and/or a worker performing the method.
- 20 5. The method of claim 3 or 4, comprising the step of providing indicia to the at least one of the one or more workers assessed for personality-type, the indicia being visibly locatable on and relating to the personality-type of the corresponding assessed worker(s).
- 25 6. The method of any one of claims 3 to 5, wherein the step of assessing worker safety comprises recording on the first data recorder one or more indicia regarding the personality-type of a worker carrying out the worker safety assessment step.
- 30 7. The method of any one of claims 3 to 6, wherein the step of assessing equipment safety comprises recording on the second data recorder one or more indicia

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regarding the personality-type of a worker carrying out the equipment safety assessment step.

8. The method of any one of claims 3 to 7, wherein the step of assessing
5 worker safety comprises recording on the first data recorder one or more indicia regarding the personality-type of one or more of one or more workers whose procedural safety is being assessed, or of a primary worker of a group of workers whose procedural safety is being assessed.

10 9. The method of claim 8, comprising the step of processing the acquired worker safety data to determine whether a set of workers having the same or similar personality-type work more or less safely than a set of workers having a different personality-type.

15 10. The method of any one of claims 3 to 9, wherein the first and second data recorders are machine readable.

11. The method of any one of claims 3 to 10, comprising the step of
20 acquiring data from the first and second data recorders for processing by a computer processing device.

12. The method of any one of claims 3 to 11, wherein the method is performed by a plurality of workers, each worker recording data relating to worker safety assessment on a respective one of the first data recorder and recording data
25 relating to equipment safety assessment on a respective one of the second data recorder.

13. The method of claim 12 when dependent on claim 11, comprising the step of processing the acquired data to provide results weighted by one or more of the
30 personality-types of the workers who recorded the data.

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14. The method of claim 4 or 5 to 13 when dependent on claim 4, wherein the personality-types include one or more task orientated worker personality-types and one or more people orientated worker personality-types.

5 15. The method of claim 14, wherein the task orientated worker personality-types include director personality-type and conscientious personality-type and the people orientated personality types include influencer personality-type and steady personality-type.

10 16. A system for assessing workplace safety comprising:
a first data recorder configured for recording results of whether one or more workers adhere to predetermined safety procedures; and
a second data recorder configured for recording results of assessing other workplace safety information.

15 17. The system of claim 16, wherein the second data recorder is configured for recording results of assessing whether one or more items of workplace equipment adhere to one or more predetermined equipment safety parameters.

20 18. The system of claim 16 or 17, wherein the first and/or second data recorders are configured for recording a predetermined personality-type of a worker recording data thereon.

25 19. The system of any one of claims 16 to 18, wherein the first data recorder is configured for recording a predetermined personality type of one or more workers being assessed for worker safety.

30 20. The system of any one of claims 16 to 19, comprising a plurality of indicators, a respective one of which is configured to be visibly locatable on a respective worker and related to a predetermined personality-type of the worker on which it is located.

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21. The system of any one of claims 16 to 20, wherein the first and second data recorders are machine readable.

5 22. The system of any one of claims 16 to 21, comprising a computer processing device configured to acquire data from the first and second data recorders for processing.

23. The system of claim 22, wherein the computer processing device
10 comprises a scanner for scanning the first and second data recorders.

24. The system of claim 22 or 23, wherein the computer processing device is configured to process the acquired data to provide results weighted by one or more of the personality-types of the workers who recorded the data.

15 25. The system of any one of claims 22 to 24, wherein the computer processing device is configured to process the acquired worker safety data from a plurality of first data recorders to compare the worker safety data of a first set of workers having the same or similar personality-type with the worker safety data of a
20 second set of workers having a personality-type different to the first set of workers.

26. The system of claim 18, 23 to 25, or 19 to 22 when dependent on claim 18, wherein the personality-types include one or more task orientated worker personality-types and one or more people orientated worker personality-types.

25 27. The system of claim 26, wherein the task orientated worker personality-types include director personality-type and analytical personality-type and the people orientated personality types include sociable personality-type and relating personality-type.

30 28. The system of any one of claims 16 to 27, wherein the first and second

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data recorders comprise respective data cards for manually recording data.

29. A set of workplace safety data recorders comprising:
at least one first data recorder configured for recording data relating to the
5 assessment of whether one or more workers adhere to predetermined safety
procedures; and
at least one second data recorder configured for recording data relating to
another workplace safety assessment.
- 10 30. The set of claim 29, wherein the second data recorder is configured for
recording data relating to the assessment of whether one or more items of workplace
equipment adhere to one or more predetermined equipment safety parameters.
- 15 31. The system of claim 29 or 30, wherein the first and second data
recorders are machine readable.
- 20 32. The system of any one of claims 29 to 31, wherein the first and second
data recorders are respective first and second cards configured for the manual
recording of information thereon.
33. A computer program or a computer program product, stored on a
computer readable medium, configured to cause a computer to process and/or analyse
the information recorded on the first and/or second data recorders in the method of
any one of claims 3 to 15.