SAFETY METER

POSITIVE PERFORMANCE MEASUREMENT TOOL

TOOL 2001
WorkCover NSW Positive Performance Measurement Tool

WorkCover. Watching out for you.
Safety Meter is a positive occupational health and safety (OHS) measurement tool. It has been designed to assist business systematically manage workplace health and safety by allowing the implementation of an employer’s OHS system to be effectively monitored.

Trials of Safety Meter demonstrate that it is a simple and easy-to-use measurement technique that provides powerful feedback to workers and management. It raises awareness about OHS issues and identifies areas of weakness in management of OHS.

Safety Meter was developed by the University of New South Wales in support of the Construction Memorandum of Understanding (MOU). The MOU was signed in 1998 between the NSW Government and the Chief Executive Officers of the principal contractors and major industry associations in the NSW construction industry. Safety Meter was adapted by the University of New South Wales from previous research by the Finnish Health and Safety Directorate.

The signatories to the MOU have worked in partnership to implement measures to improve the construction industry’s OHS and injury management performance.

While Safety Meter was developed with the construction industry in mind, it is highly beneficial for use in any industry sector.

Other products developed under the auspices of the Construction MOU are:

1. Subby Pack: OHS Contractor Management Tool
2. CHAIR: Safety in Design Tool
3. Hazard Profile: Identification Tool for Metal Roofing

Identification Tool for Electrical Hazards on-site

Identification Tool for Bricklaying

Identification Tool for Formwork

Identification Tool for Aluminium Mobile Scaffolds

Identification Tool for Steel Reinforcement Fixing

Identification Tool for Concrete Placement

Identification Tool for Demolition


Another valuable tool to assist small and medium-sized businesses to systematically manage safety is WorkCover's Workplace Safety Kit.

More information about each of these products can be obtained by contacting WorkCover NSW on 131050 or www.workcover.nsw.gov.au.
INTRODUCTION

WHAT IS SAFETY METER?

HOW DO I USE SAFETY METER TO MEASURE OHS IN MY WORKPLACE?

Step 1: Develop categories to measure

Step 2: Develop a criteria to measure each category

Step 3: Appraise the workplace using the developed criteria

Step 4: Record your inspection

Step 5: Calculate the score

Step 6: Feedback positive performance

SUMMARY OF KEY STEPS

ATTACHMENT 1

ATTACHMENT 2

ATTACHMENT 3
In the past, occupational health and safety (OHS) performance measurement has been preoccupied with the negative outcomes of workplace incidents and illness rather than pro-active prevention strategies. The most common way to identify these failures has been the use of Lost Time Injury Frequency Rates and Workers Compensation statistics, or other similar statistically-based measures. These measures, when considered in isolation, are now almost universally regarded as unsuccessful in providing meaningful measures of safety performance.

To accurately record workplace safety performance, and therefore the effectiveness of the implementation of any workplace OHS management system, the use of process indicators (that measure “what gets done”) in addition to outcome measures is required. In other words, how well OHS management is performing in a workplace, plus how well a workforce implements OHS requirements, should be measured.

Safety Meter is a positive performance measurement tool developed to appraise both OHS system implementation and the behaviour of employees working within such a system. The tool was adapted by the University of New South Wales from previous research by the Finnish Health and Safety Directorate. The approach accords with research indicating that positive feedback provides better motivation than negative feedback.
Safety Meter is an OHS positive performance measurement and feedback tool. The technique is based on a traditional regular OHS workplace inspection method, but instead records both "compliance" and "non-compliance" to selected categories of measurement. Agreed criteria are used to determine whether performance complies in the categories selected. The result is expressed as a score representing the percentage correct, together with a traditional list of items for rectification. The score should be graphed and displayed in prominent workplace locations to provide positive OHS feedback and reinforcement to workers and managers.

Extensive trials by the University of New South Wales have confirmed that Safety Meter is a valuable tool to snapshot the safety performance of a workplace at a particular point in time. In addition, the trials indicated that use of feedback posters (illustrated in Attachment 1) improved safety awareness among workplaces and stimulated a desire to improve OHS performance. This level of interest and heightened awareness resulted in friendly competition between different work areas to improve work safety.
Step 1: Develop categories to measure

Categories for measurement using Safety Meter must be developed for each workplace. Each category should be regarded by both workplace personnel and management as important indicators of safety and should reflect key areas of risk in the industry or work sector. A maximum of eight categories is recommended.

For example, trials developed the following six categories for use at construction sites:

1. Work practices (e.g., use of personal protective equipment);
2. Housekeeping (e.g., clear access, bins emptied, rubbish not restricting work flow);
3. Electrical and lighting (e.g., sufficient lighting to work areas, inspection and maintenance of electrical equipment);
4. Scaffold and ladders (e.g., proper erection and supporting foundation, ladder angled correctly and tied off);
5. Protection against falls (by persons) and falling objects (e.g., appropriate edge protection and/or fall restraint, overhead protection);
6. Plant and equipment (e.g., verification of routine maintenance, required guarding, appropriate storage).

These six categories are closely related to statistics that list the major causes of fatalities in the NSW construction sector. For example, falls from height and falling objects are some of the biggest causes of fatalities and are reflected in category 5.

Accident statistics for a particular industry or work sector may provide some guidance in developing categories for measurement in a workplace. It also makes sense to involve the workforce in the selection of categories and the other steps. Consultation also helps provide ownership of the measurement technique.

Step 2: Develop a criteria to measure each category

Once the categories for measurement have been determined, a criteria must be established against which each category can be measured. Figure 1 shows the criteria developed for construction industry trials carried out by the University of New South Wales. The criteria reflect a mix of legislative requirements as well as standard industry safety practices.
### Category 1: Work practices
- **Principles**: In each work area or square observe:
  - Each worker.
- **Criteria for "correct" score**: The person uses the required Personal Protective Equipment or safety equipment correctly and is not taking any obvious risk, e.g., harness attached, use of ear and eye protection, use of a screen when welding.

### Category 2: Housekeeping
- **Principles**: In each work area or square observe:
  - Each worker.
  - Access ways are clear.
  - Waste bins not over flowing.
  - General work area is clear of trip hazards and any rubbish or offcuts do not affect the work flow.
  - Working platform clear, e.g., deck on scaffold or formwork frames are clear.

### Category 3: Electrical and Lighting
- **Principles**: In each work area or square observe:
  - Each lead or other piece of equipment;
  - Earth Leakage Switch;
  - Lighting.
- **Criteria for "correct" score**: Leads off the ground and no exposed wires or cuts.
  - Equipment, including switchboard, is tagged and current.
  - Earth Leakage switch fitted to mains supply or portable generator.
  - Lighting adequate enough to conduct work activities.

### Category 4: Scaffold and Ladders
- **Principles**: In each work area or square observe:
  - Each section of scaffold;
  - Each ladder.
- **Criteria for "correct" score**: Ladder tied off and angled correctly.
  - Scaffold adequately braced and tied in at regular intervals.
  - Mobile assembled correctly, e.g., adequate ladder, bracing and toeboards where necessary.
  - No large gaps between perimeter edge and scaffold.

### Category 5: Protection Against Falls and Falling Objects
- **Principles**: In each work area or square observe:
  - Each section of handrail;
  - Each penetration;
  - Each section of overhead protection.
- **Criteria for "correct" score**: Adequate edge protection in place.
  - Penetration covered and cover secured.
  - Adequate overhead protection.

### Category 6: Plant and Equipment
- **Principles**: In each work area or square observe:
  - Each piece of plant and equipment.
- **Criteria for "correct" score**: Appropriate guards fitted to plant and equipment.
  - Flashing light and reversing buzzer operating on all mobile plant, e.g., loader, bobcat, and backhoe when positioned on a public road.
  - As above (if fitted as standard) on all mobile plant operating on site. Appropriate plant/machine guards in place.
  - Oxy and Acetylene bottles stored correctly.
  - Log book or service tags up to date.
The objective of Safety Meter is to enable instant visual appraisal of a work practice or item of plant and equipment in the workplace, without referring to documentation or other means that may not be readily available. For example, a log book outlining maintenance may be contained within a forklift cab and can therefore easily be appraised at a glance. But the records for training of personnel on the shop floor would not be readily available and are therefore beyond the scope of Safety Meter. However, an item can be listed for attention on the rectification sheet for action at a later time (e.g., review first aid training currency) but would not typically be included in the Safety Meter scoring process. In other words, if you don’t know how to critique or appraise an item in the workplace or information is not available, don’t measure it.

Step 3: Appraise the workplace using the developed criteria

Once the categories of measurement have been determined and prescribed criteria developed so that a "correct" or "not correct" score can be decided, the tool is ready for use. To start an inspection the person or persons conducting a measurement should proceed in a pre-determined logical sequence. For example, on a multi levelled construction site this may involve starting at the top and working downwards. In a single level factory this may involve starting at one end and proceeding in a logical sequence through to the other end.

Measurement is conducted by dividing a workplace into "areas" or "squares", where those conducting the measurement can stand and observe the work or the condition of the workplace. For example, on a high rise construction project this may be individual floors or parts thereof. In a factory, this may be work areas defined by visible boundaries.

To measure an area or square, each item (which falls under the categories developed) is scored as "correct" if its meets the safety requirements of the defined criteria. Remember that the criteria is used as a "guide only" in how to undertake the measurement technique. It cannot hope to cover every single item or situation that may arise in a large workplace. Legislation and other guidelines may dictate how other items are appraised. However, broadly speaking all items appraised should fall within the categories determined for measurement. Remember, if the person conducting the measurement is not sure how to score the item, then it is not scored at all.

A minimum of 100 measurements for a workplace across all categories is preferred to provide a suitable measurement base. That is, a statistically representative sample of the workplace. Figure 2 provides a typical score sheet used for trials in the construction industry.
A proforma Safety Meter Score Sheet has been included as Attachment 2.

It is important to stress that trials have demonstrated that the time taken to conduct the Safety Meter measurement takes no more time than a normal workplace inspection. As with all inspections, the time taken is in recording OHS defects and determining those responsible for undertaking corrective action.

Safety Meter provides a "snapshot" only. In a large workplace the person conducting the measurement cannot hope to appraise every single working person, piece of plant, electrical item or hazard. The aim of Safety Meter is to appraise the whole workplace and measure as much as possible. For example, in a large workplace there may be 200 pieces of plant in operation. You may randomly check all or some of the logbooks, tags, guards and so on of all or some of the plant items or those items with which you are unfamiliar. In a smaller workplace the person conducting the measurement may be able to appraise all plant.

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**Figure 2: Score sheet used in construction industry trials**

<table>
<thead>
<tr>
<th>Object</th>
<th>Correct</th>
<th>Total</th>
<th>Not correct</th>
<th>Total</th>
<th>%</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Work practices</td>
<td>HHT HHT HHT HHT HHT</td>
<td>51</td>
<td>HHT HHT HHT HHT HHT</td>
<td>15</td>
<td>77</td>
</tr>
<tr>
<td>2. Housekeeping</td>
<td>HHT HHT HHT HHT HHT</td>
<td>34</td>
<td>HHT HHT HHT HHT HHT</td>
<td>2</td>
<td>94</td>
</tr>
<tr>
<td>3. Electricity and Lighting</td>
<td>HHT HHT HHT HHT HHT HHT HHT</td>
<td>63</td>
<td>HHT HHT HHT HHT HHT HHT HHT</td>
<td>33</td>
<td>66</td>
</tr>
<tr>
<td>4. Scaffold and ladders</td>
<td>HHT HHT HHT</td>
<td>23</td>
<td>HHT HHT HHT HHT</td>
<td>11</td>
<td>68</td>
</tr>
<tr>
<td>5. Protection against falls and falling objects</td>
<td>HHT HHT HHT HHT HHT HHT HHT HHT HHT</td>
<td>54</td>
<td>HHT HHT HHT HHT HHT HHT HHT HHT</td>
<td>25</td>
<td>68</td>
</tr>
<tr>
<td>6. Plant and equipment</td>
<td>HHT HHT HHT</td>
<td>7</td>
<td>HHT HHT HHT HHT</td>
<td>6</td>
<td>54</td>
</tr>
</tbody>
</table>

| Total Correct                        | 232     | Total Not Correct | 92    |
Step 4: Record your inspection

As an example, to measure category 1 "Work Practices" the person conducting the measurement walks into an area and observes as many workers as practical. If each worker uses all the relevant safety equipment required for the task they are undertaking and is not taking any obvious risk then they score one "correct" mark. For example, in the construction trials if a worker was observed using a power saw and that worker was wearing a hard hat and boots but no eye or ear protection, then that was scored as one "not correct" mark because of the lack of eye or ear protection. In other words, each individual item measured under any of the categories determined can only score one "correct" or one "not correct" mark, irrespective of how many aspects of the item are in fact "correct" or "not correct".

When a "correct item" is observed it is recorded using a single stroke on a score sheet such as that displayed in Figure 2. "Not correct" items are also recorded using the same method, but it is strongly recommended that in addition all "not correct" items should be noted for corrective action using a sheet such as that displayed in Figure 3. A proforma Safety Meter Corrective Action Sheet is included as Attachment 3.

Recording items for corrective action enables a more accurate picture of a workplace to be developed over time. In addition, repeat items that have not been actioned from the previous measurement can be identified and actioned in a formal way to provide an appropriate audit trail for management.

Figure 3: Typical sheet used to record corrective actions

<table>
<thead>
<tr>
<th>Area or square</th>
<th>Defect description</th>
<th>Repeat item</th>
<th>Action by who?</th>
<th>Action by when?</th>
<th>Action Complete</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>Yes or No</td>
<td></td>
<td></td>
<td>Sign off Date</td>
</tr>
<tr>
<td>Joinery workshop</td>
<td>No machine guarding to electric bench grinder</td>
<td>No</td>
<td>Area supervisor</td>
<td>Immediate (high risk)</td>
<td></td>
</tr>
<tr>
<td>Joinery workshop</td>
<td>Clean up required.</td>
<td>No</td>
<td>Joinery workers</td>
<td>Within 48 hrs (low risk)</td>
<td></td>
</tr>
<tr>
<td>Joinery workshop</td>
<td>Fire extinguisher out of service.</td>
<td>Yes</td>
<td>Factory manager</td>
<td>Within 7 days (medium risk of fire)</td>
<td></td>
</tr>
</tbody>
</table>

* A repeat item is one that has not been corrected from the previous inspection/s.
Step 5: Calculate the score

The Safety Meter score for a workplace as a whole is calculated by adding the total number of "correct items" and then separately adding the total number of "not correct" items (see Total columns in Figure 2). The score is then calculated by using the formula in Figure 4.

The overall safety score calculated for a workplace provides a guide about how well OHS is managed in that workplace and how effectively people are working within that OHS management system. However, it must be highlighted that each "not correct" item scores only one stroke irrespective of the level of danger (risk) associated with that item. In other words, the "not correct" score for an open penetration in a floor is the same as for a person not wearing safety glasses. This means that the overall safety score derived using Safety Meter must be taken as a guide only to how well safety is being implemented in the workplace. Therefore the person or persons undertaking the Safety Meter measurement must allocate the appropriate level of action according to the level of risk of the item identified for rectification. In the above example the penetration may be flagged "high risk - immediate action" while the person identified as not wearing safety glasses may be flagged "medium risk - action within 24 hours".

The above formula can also be used to calculate the safety score for each individual category identified for measurement in a workplace. This is illustrated in the final column of Figure 2. This enables individual categories to be monitored and provides explanation as to why an overall workplace score may fluctuate up or down. Trials have identified this aspect of Safety Meter as valuable in assisting workplace management to identify areas of OHS weakness where intervention strategies should be targeted.

Figure 4: Calculating the Safety Meter score

| Safety Score | \[
| \frac{\text{Total "correct"}}{\text{Total "correct"} + \text{Total "not-correct"}} \times 100 = \% \] |

The sample results provided in Figure 2 provide an overall safety score of 72%.
**Step 6: Feedback positive performance**

One of the principal aims of Safety Meter is to report what is right, not wrong. Safety Meter is intended to provide positive feedback to the workplace and involve personnel in the method of measurement and the development of strategies aimed at improvement. This can be done by displaying the score at a workplace in prominent locations by using posters or briefing the workforce through the Safety Committee.

Research at the University of NSW involving trials of Safety Meter identified that those workplaces who displayed the score and categories, recorded a more "positive" workplace attitude to OHS issues among the workforce and line managers and better overall safety scores. This change in attitude was demonstrated by some workplaces opting to provide token rewards for improvement over time in the Safety Meter score. Others developed a friendly contest between two distinct areas of a workplace which were of sufficient size to be measured separately. In some workplaces the loser bought a Lotto ticket for the winner. Management at another workplace provided a lunch-time barbecue for workers when they achieved an agreed target score of 85%.

Some sample feedback posters have been set out in Attachment 1.

<table>
<thead>
<tr>
<th>Summary of key steps</th>
</tr>
</thead>
<tbody>
<tr>
<td>- Consider measuring areas of some large workplaces separately so that friendly rivalry can be encouraged between these areas and token rewards provided.</td>
</tr>
<tr>
<td>- Develop categories against which workplace safety can be measured, e.g., housekeeping.</td>
</tr>
<tr>
<td>- Develop criteria against which each category can be measured as &quot;correct&quot; or &quot;not correct&quot;.</td>
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<tr>
<td>- Inspect the workplace in a logical sequence by dividing it into areas or squares.</td>
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<tr>
<td>- Appraise each work area or square against the determined categories and associated criteria.</td>
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<tr>
<td>- Record measurements on a score sheet.</td>
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<tr>
<td>- Develop a list of &quot;not correct&quot; items for action based on the level of risk.</td>
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<tr>
<td>- Calculate the safety score.</td>
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<tr>
<td>- Calculate individual scores for each category to target intervention strategies.</td>
</tr>
<tr>
<td>- Plot the scores over time to help gain an accurate picture of safety performance.</td>
</tr>
<tr>
<td>- Provide feedback to the workforce through posters to help raise awareness.</td>
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</tbody>
</table>
Sample Safety Meter Feedback Poster*

* Blow your posters up to A3 size on your photocopier and display prominently.
### Proforma Safety Meter Score Sheet

<table>
<thead>
<tr>
<th>Category</th>
<th>Correct</th>
<th>Total</th>
<th>Not correct</th>
<th>Total</th>
<th>%</th>
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</thead>
<tbody>
<tr>
<td>Work Practices</td>
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<td>Housekeeping</td>
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<td>Electricity and Lighting</td>
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<td>Plant and equipment</td>
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<td><strong>Total Correct</strong></td>
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<td><strong>Total Not Correct</strong></td>
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**Reminder Notes:** Wherever possible take a minimum of 100 measurements or more. If you are not sure how to score an item, leave it out of the measurement.
## Proforma Safety Meter Corrective Action Sheet

<table>
<thead>
<tr>
<th>Area or square</th>
<th>Defect description</th>
<th>Repeat item</th>
<th>Action by who?</th>
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<th>Action complete</th>
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</tbody>
</table>
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