# Cost of Error Calculator

# User Guide

HPA
HUMAN PERFORMANCE ASSOCIATION

The Cost of Error Calculator provides you with the means by which to calculate the current financial cost of human error within your organization. By knowing how much human error is currently costing you, you can then identify your Return on Investment (ROI) for efforts being considered/undertaken to reduce human error and improve human performance within your organization.

This document provides instruction on how to use the Cost of Error Calculator, including where appropriate, [source] references and explanations of the fields, values, and formulas used.

## I. Calculator Access

The Cost of Error Calculator can be accessed online at http://www.costoferror.com/hpa/

Your information can be directly input into the fields of the online calculator. You will note that many fields populate and category calculations occur automatically as you enter your data.

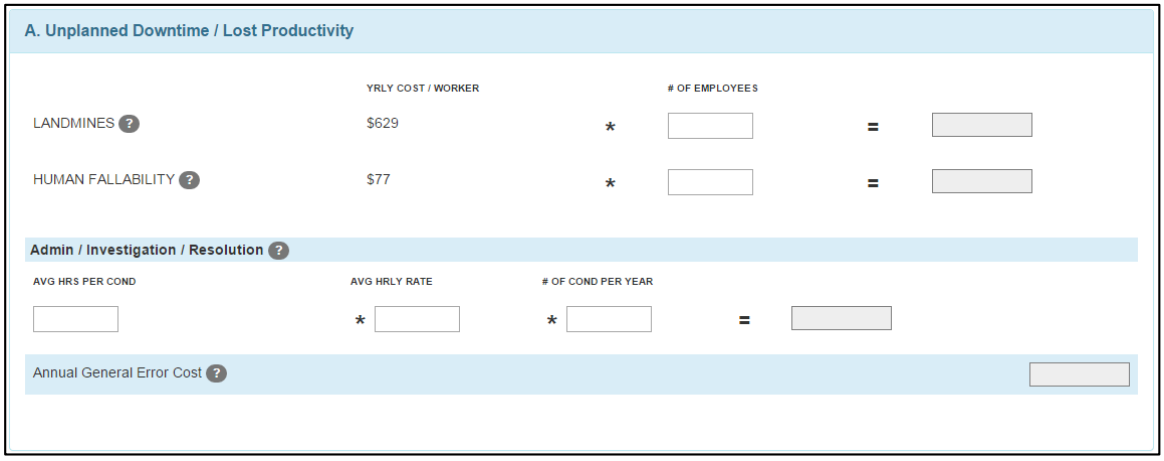
When you have completed all fields, you may then convert your data to pdf format and download your completed calculator.

## II. Part I Guidelines and References

As shown in Figure I, Part I divides the ongoing annual cost of human error into three categories:

- Unplanned Downtime / Lost Productivity
- Injuries, Illnesses, and Fatalities
- Physical Plant / Environmental Costs

# A. Unplanned Downtime / Lost Productivity




## LANDMINES

When "human error" occurs within an organization, 84 to 94 percent of the time some aspect of the associated processes, programs, and/or organizational structures directly contributes to the occurrence. These "setups" for error are known as "landmines". (Note: Many within the human performance arena refer to these as, "Latent Organizational Weaknesses (LOWs).")

As indicated within the Calculator, the average annual costs associated with organizational landmines equates to $629 per employee. [source] This number is derived from an extensive study of over 400 US and UK organizations completed by IDC (http://www.idc.com), which concluded that the "general" costs (rework, minor misstep recovery, etc.) of human error within organizations averages $706 per worker. Using the mid-range (89%) equates to $629.

## # OF EMPLOYEES

Enter the total number of employees (at all levels) working within the organization being analyzed.

## HUMAN FALLABILITY

While landmines are present in the majority of conditions involving "human error", an allowance must be made for human fallibility. Since the range of 84 to 94 percent is generally accepted (see above), this leaves a range of six to sixteen percent purely attributable to people "screwing up". The mid-range (11%) results in an average human fallibility cost of $77 per employee per year.

The Calculator multiplies each of these figures times the total number of employees in the unit/organization being analyzed to arrive at an annual "generic" cost of human error.

ADMIN / INVESTIGATION / RESOLUTION

This section accounts for the resources directly expended to investigate, resolve, and administer the errors that do occur. For input into these fields, consider the current status of how errors and events are investigated and resolved within your organization.

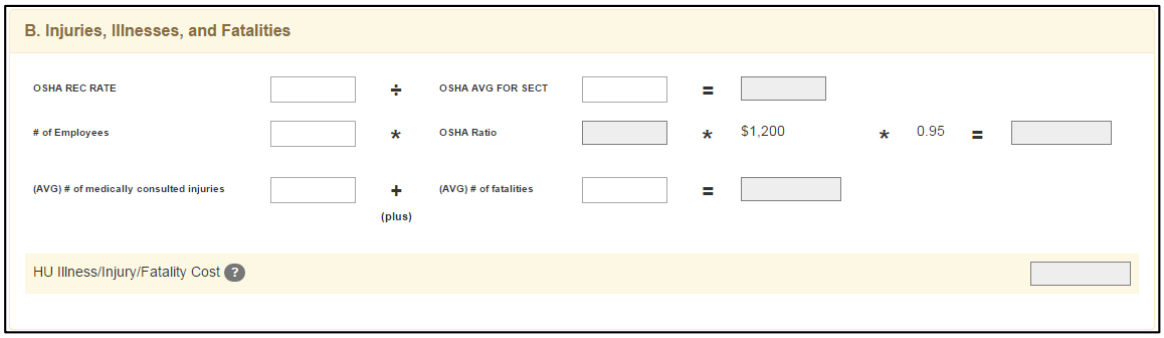
Note the fields titled, "AVG HRS PER COND" and, "# OF COND PER YR". In these fields, "COND" represents "Condition", which is any occurrence that you would devote resources to investigating/resolving.

For "AVG HRLY RATE", simply use an average hourly pay rate of those involved in the investigation, resolution and administration of errors and events.

**Annual General Error Cost**

The calculator will automatically calculate the current generic costs (rework, recovery from missteps, etc.) of human error within your organization.

## B. Injuries, Illnesses, and Fatalities




The "OSHA REC RATE" is for entry of your current OSHA Recordable Rate.

The "OSHA AVG FOR SECT" is for entry of the latest US OSHA Recordable national average for your industry/sector. You most likely know this number. If not, you can acquire it from your Safety Department, or you can access the information at: http://www.bls.gov/.

By dividing your Illness & Injury Rate by the national average for your industry/sector, you achieve a ratio used in the subsequent formula.

The next calculation works as follows:

# OF EMPLOYEES
This should be the same number as used in the previous section.

OSHA RATIO
This is the ratio identified in the previous step of this section. This ratio is necessary for accurate application of the ($1,200) figure to your organization (see below).

$1,200
This is the value of goods or services each worker must produce to offset the cost of work injuries. It is calculated as an average across all industries (and is not the average cost of an individual work injury). This number is provided by the US National Safety Council (http://www.nsc.org).

> **Note:** This figure is an average cost. Acute substantial injuries and/or fatalities result in much more extensive costs (as indicated below). Barring an inordinate number of more substantial events, the number provided ($1,200) multiplied by your OSHA Ratio, should provide an accurate projection of costs at current incident rates.

0.95
This figure represents the percentage of workplace illnesses / injuries that typically involve human error (95%).

(AVG) # OF MEDICALLY CONSULTED INJURIES
The $1,200 indicated in the previous section is the estimated internal cost to cover for workplace illnesses/injuries (overtime coverage, rework, etc.). When an illness/injury requires external attention, the costs rise dramatically.

While some are less and some are [much] more, the Cost of Error Calculator utilizes an average cost of $36,000 for any injury requiring external medical consultation. [source] US National Safety Council (http://www.nsc.org).

For a consistent overall calculation, you may want to use the average number of incidents requiring external medical consultation over the past three years. Enter this number in the space provided.

(AVG) # OF FATALITIES

The average cost of a fatality in the workplace is currently estimated at $1,330,000. [source] US National Safety Council (http://www.nsc.org).

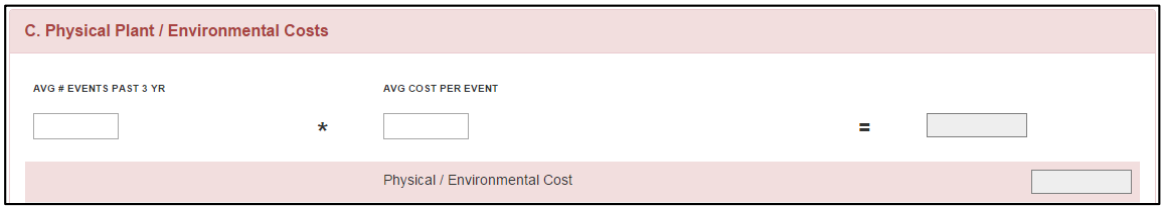
Enter the average number of fatalities for the period being analyzed. Again, unless you are analyzing for a specific period, use your average number of fatalities over the past three years.

**HU Illness/Injury/Fatality Cost**

The calculator will automatically calculate the dollar costs of illnesses, injuries, and fatalities that your organization is currently experiencing. Please note that all medical costs are multiplied by 0.95 to account for the 95% relationship between safety incidents and human error.

## C. Physical Plant / Environmental Costs

This section allows for the calculation of an average cost of human error resulting in physical / discreet damage to equipment, facilities, etc., and/or environmental cleanup / regulatory costs.




AVG # OF EVENTS PAST 3 YR

Identify the total number of events involving human error that you have had over the past three years that resulted in overt/external costs to replace equipment and/or facilities, as well as environmental cleanup, regulatory fines, etc. Take this total number and divide by three to get your average number for the past three years. Enter this number in the space provided.

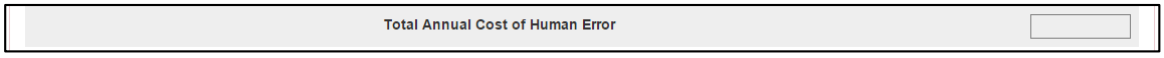
AVG COST PER EVENT

Calculate the total dollar cost for the events identified in previous step and divide by the total number of events involved. Enter this number in the space provided.

**Physical/Environmental Cost**

The calculator will automatically calculate your average dollar costs over the past three years of events involving human error that resulted in equipment damage, environmental cleanup, and/or associated regulatory fines/levies.

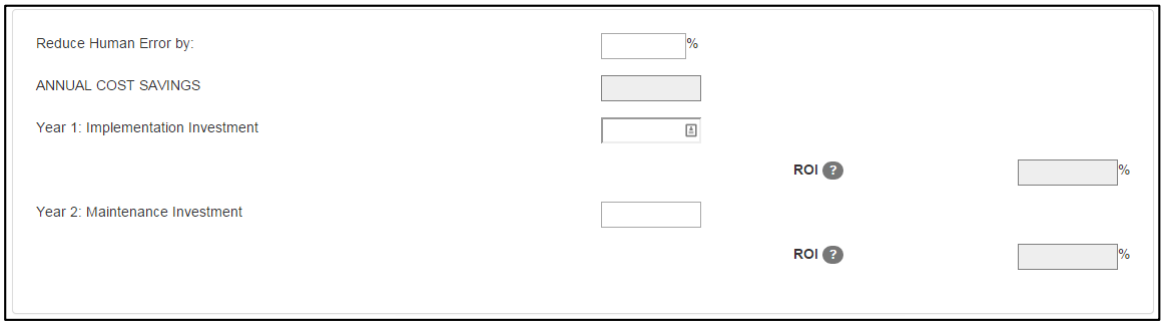
## D. Total Annual Cost of Human Error




Once the three categories (General Human Error, Illnesses/Injuries/Fatalities, and Physical/Environmental) are calculated, the Calculator then sums the total to calculate your current annual cost of human error.

# III. Part II: Human Error Reduction Return on Investment (ROI)

In Part II, the Calculator provides a simple mechanism for calculating Return on Investment (ROI) of any Performance Improvement (PI) effort being considered. This allows for a coherent business decision to be made on how/whether to proceed.




## A. Reduce Human Error by:

The first field is used to enter your goal/target for human error reduction. First, while a goal/target of zero "events" (significant/catastrophic occurrences) is viable, a goal/target of zero errors is not realistic. Therefore, entering "100%" in this field is not appropriate. While a concerted human performance enhancement effort, properly supported, implemented, and nurtured, should generally reduce error rates by at least 75%, it is recommended that a number of 50% be entered here in order to be conservative relative to the ROI calculation that results.

When you enter this number, the Calculator will automatically calculate and populate the **ANNUAL COST SAVINGS** field.

## B. Year 1 Implementation Investment

The initial efforts in any implementation effort are typically going to incur the greatest resource investment. The calculator has been set up for you to enter your total estimated cost of implementation during "Year 1". This may include vendor / consultant costs, dedicated internal staff, any overtime paid for workers to attend training, any materials provided during training, campaign awards, etc.

When you enter the amount of your investment, the Calculator will automatically calculate your Return on Investment (ROI) during your initial year of implementation

## C. Year 2 Implementation Investment

The Calculator is set to automatically enter a "maintenance" investment of 10% of the initial investment amount. Maintenance costs include such things as refresher training, ongoing promotional campaigns, projects undertaken by your Performance Improvement Team, etc. When implemented properly and maintained, the ROI for Year 2 (and subsequent years) will be much higher than for Year 1.

If desired, you may override the auto population of the Year 2 Maintenance Investment field and enter any dollar investment amount you desire.

# IV. Download PDF Version

Once you have completed the Calculator you may SAVE it by using the Download PDF Version button located below Part II.


**NOTE: The Download PDF Version function only works when all fields of the form have been completed.**

You may reuse the calculator as many times / as often as you desire, saving each iteration by downloading your results using the PDF function.

## V. Conclusion

Thanks for your interest in identifying how much human error is currently costing you and your organization, and for (hopefully) taking actions to drive the incidence of human error within your organization to the lowest possible levels of frequency and severity.

The HPA Cost of Error Calculator has been prepared to help you make educated business decisions regarding your current costs of human error, including calculation of your Return On Investment (ROI) for efforts you may be considering to improve your performance.

If you have any questions, or simply want to learn more about the next-level Services and Products available to help your organization rapidly and sustainably reduce human error, contact the Human Performance Association, Inc. (HPA). You may do so through the HPA website (http://www.hpaweb.org), via email at CostOfError@hpaweb.org, or by calling the HPA directly at 1-307-637-0958.