

# **AFPM Incident Classification Matrix Supplemental Information**

## Table of Contents:

1. Disclaimers
2. Introduction
  - a. How to Use this Document
3. Definitions
4. How to Use the Matrix
  - a. Steps for Using the Matrix
  - b. Example Incident Classification
5. Frequently Asked Questions
6. Incident Classification Examples

## **1. Disclaimers**

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## **2. Introduction**

The Total Recordable Incident Rate (TRIR) for refining and petrochemical industries has decreased from 7.6 to 0.7 over the past 30 years, in part because of a demonstrated commitment to safety improvement by our members. Despite the reduction in TRIR over time, the number of fatalities and serious injuries continues to rise.

Near miss incidents frequently precede fatalities and loss producing events, but are not adequately tracked by traditional metrics such as TRIR and Days Away From Work Rate (DAWR). These near miss events are important indicators of deficiencies within a safety management system. Data that is collected and analyzed from high potential near miss incidents can be used to identify areas of improvement for an organization, before a serious incident occurs.

To assist our members in identifying these areas of improvement, the AFPM Safety and Health Committee has developed an incident classification matrix that will measure actual and potential incidents of serious, 'life-altering' potential. The goal of the incident

classification matrix is to drive the identification and understanding of the types of incidents that pose the most risk to health and safety in our industry. In addition, the matrix will facilitate benchmarking to allow member companies to assess their individual performance.

### 3. Definitions

- a. Severity Categories: The seriousness of the incident. Reflected in the columns of the Incident Matrix spreadsheet.
  - i. Tier 1a Incident: **actual**, serious injury that caused a fatality, hospitalization, or other life-altering event
  - ii. Tier 1p Incident: an incident with the **potential** for fatality, hospitalization, or other life-altering event. This can also include high potential near miss incidents.
  - iii. Tier 2: an occurring incident with a moderate actual or potential outcome.
  - iv. Tier 3: an occurring incident with low risk actual or potential outcomes.
- b. Injury Type/Consequence: the injury or potential injury resulting from the incident, such as broken bones, burns, or loss of consciousness. Reflected in the rows on the top half of the Incident Matrix spreadsheet.
- c. Activity/Cause of Injury: The type of work that is being performed during the incident, such as working at heights, energy isolation, or confined space entry. Reflected in the rows on the bottom half of the Incident Matrix spreadsheet.
- d. Hospitalization: any overnight hospitalization for treatment. This does not include admittance for observation. Outpatient services are not considered hospitalization.
- e. Medical treatment: treatment required and administered by a licensed healthcare provider.
- f. Life-altering: long-term or permanent injury/illness with severe impact to daily activities.

### 4. How to Use the Matrix

The Incident Classification Matrix records events and classifies them by cause and consequence into categories of severity. Each cause must have an associated consequence.

In addition to evaluating the severity, cause, and consequence of an incident, companies should also separately evaluate the OSHA recordability of an incident. The recordability of an incident has no impact on its place in the Matrix. However, a better understanding of which incidents are recordable will help AFPM focus programs on the incidents that most impact industry.

Each company should submit one copy of their Incident Matrix data annually. Companies with multiple facilities should aggregate their site data prior to submitting data to AFPM.

a. Steps for Using the Matrix

### Step One: Identify the Severity of the Incident.

Choose the appropriate Tier (Tier 1a, Tier 1p, etc). Use this to determine which column to use when inputting incident data.



### Step Two: Identify the Consequence of the Incident.

Input a '1' in the row that aligns most closely to the consequence. Keep this in the column selected in Step 1.



### Step Three: Identify the Cause of the Incident.

Input a '1' in the row that aligns most closely to the cause of the incident. Keep this in the column selected in Step 1.



### Step Four: Determine the OSHA Recordability of the Incident.

If the incident resulted in an OSHA recordable, then input the number of recordable injuries the incident caused at the intersection of the OSHA Recordable column and the Consequence row.

**b. Example of Classifying and Incident Using the Matrix**

**A worker narrowly misses being hit in the head by a five pound wrench falling from 30 feet above him.**

**Step One: Identify the Severity of the Incident.**

Although the worker was not injured by the falling wrench, the height from which the object fell, combined with the weight of the wrench, created the potential for severe injury.

This incident belongs in the Tier 1p - High Potential Incident Column.

**Step 2: Identify the Consequence of the Incident.**

The potential consequence of this incident was a fracture or laceration from being hit with the falling wrench.

Record the incident in Box #46: Potential for serious injury from falling objects. This is the intersection of the Severity Column (Tier 1p) and the Consequence Row (Laceration/Fracture).

**Step 3: Identify the cause or activity responsible for the incident.**

The cause of this incident was a dropped object in an unprotected area.

Record the incident in Box #55: Dropped object in unprotected area with potential for fatality/serious injury. This is the intersection of the Severity Column (Tier 1p) with the Cause Row (Dropped Objects)

**Step Four: Determine the recordability of the incident.**

The incident was a near miss, and the worker was not injured. This is not an OSHA recordable incident, and nothing should be marked in the 'OSHA recordable' column.

## 5. Frequently Asked Questions

- a. Can I have an Injury Activity/Cause without having an Incident Type/Consequence?
  - i. No. For every Injury Activity/Cause, there must be a coinciding Incident Type/Consequence recorded.
- b. If I record the Injury Activity/Cause under the Tier 1a column, can I record the coinciding Incident Type/Consequence under the Tier 1p column or vice versa?
  - i. No. Each incident should be classified under a single level of severity. Use the same column for both the activity/cause of injury and the incident type/consequence.
- c. Why is AFPM collecting information on OSHA recordability of incidents? I thought that the recordability of the incident had no bearing on its classification in the Matrix.
  - i. While the recordability of the incident does not influence its classification in the Matrix, the AFPM Safety & Health Committee is interested in better understanding which types of incidents in our industry result in the most recordable incidents. This will help AFPM focus future projects and information on preventing incidents that could result in OSHA recordability.

By definition, a Tier 1a event will result in an OSHA recordable incident, because a Tier 1a incident is one that results in a fatality or hospitalization. Some Tier 1p incidents will result in a recordable injury, but not all.

To use this column, record the incident using the process described above. Then, if the incident resulted in an OSHA recordable injury or injuries, add the number of recordable injuries the incident caused in the box to the right of the Activity/Cause selected for the incident.

- d. What if a single incident, such as an H<sub>2</sub>S release, causes multiple injuries? Do I record the consequence for each person injured?
  - i. No. The Activity/Cause and Consequence aspect of the Incident Classification Matrix only measures the number of incidents, not the number of people injured in the incident.
  - ii. However, if the incident resulted in multiple OSHA recordable injuries, use the Recordable column located to the right of the severity column to note how many OSHA recordables resulted from the incident.
- e. Why are the energy isolation and confined space sections so detailed?

- f. Data collected from the refining and petrochemical industries has shown that energy isolation is one of the most common causes of Tier 1a and Tier 1p incidents. Collecting more detailed data about the causes of Energy Isolation incidents will help AFPM create targeted resources.
- g. Do all OSHA recordable incidents equal Tier 1a incidents?
  - i. No. Tier 1a incidents are only those that result in hospitalization, death, or other life-altering events. Recordable incidents that result in one of these outcomes should be classified as Tier 1a incidents. However, recordable incidents that do not result in these outcomes should not be classified as a Tier 1a incident.
  - ii. For example, a sprained ankle that does not require hospitalization would be a recordable incident, but not a Tier 1a incident.

## 6. Incident Classification Examples

These examples are taken from actual incidents that occurred in the refining and petrochemical industries. The purpose of this section is to assist AFPM members in classifying incidents that are confusing in some way.

- a. A mechanical tool catastrophically failed, striking the worker and resulting in a fatality.
  - i. This incident resulted in a fatality, meaning that it would be classified as a Tier 1a incident.
  - ii. The fatality resulted from the tool striking the worker. This would be best reflected in Box #9: any concussion, amputation, fracture, laceration, joint, or ligament damage.
  - iii. The injury was caused by a catastrophic tool failure. This is best reflected by Box #16: Worker caught by machinery, struck by debris or equipment.
  - iv. This incident resulted in a fatality, meaning that it is an OSHA recordable incident. This should be reflected in the 'OSHA Recordable' column.
- b. Maintenance workers receive a permit to install a blind and open the wrong line. Two workers are burned and hospitalized.
  - i. This incident resulted in a hospitalization, so it would be classified as a Tier 1a incident.
  - ii. The incident was caused by workers opening the wrong blind. This would best be reflected by Box # 25: Blinding Error: wrong location, removed wrong blind.
  - iii. The incident resulted in two workers hospitalized for burns. This is best reflected by Box #8: Any burn from hot materials, corrosives, or contact with hot surfaces.
  - iv. The incident resulted in an OSHA recordable incident.

- c. Entry is made into a confined space where all the flanges were not blinded. One worker was exposed to H<sub>2</sub>S and found unconscious and was later hospitalized.
  - i. The incident resulted in a hospitalization and is therefore a Tier 1a incident.
  - ii. The incident was caused by a failure to blind all flanges in the confined space. This is best reflected by Box #25: Blinding Error: wrong location, removed wrong blind.
  - iii. The Incident resulted in a worker exposed to H<sub>2</sub>S. This is best reflected by Box #1: an unprotected H<sub>2</sub>S exposure event.
  - iv. The incident resulted in a hospitalization. This should be reflected in the OSHA recordable column.
- d. A worker performed work on equipment that was not properly de-energized, nor verified as energy-free. The worker received steam burns and was hospitalized.
  - i. The incident resulted in a hospitalization and should be classified as a Tier 1a incident.
  - ii. The incident was caused by not verifying that equipment was caused by not verifying that it was energy free. This is best reflected by Box #20: Failure to verify absence of energy.
  - iii. The incident resulted in the worker receiving steam burns. This is best reflected by Box #9: energy control failure from exposure to process energy, toxic materials, or hot materials.
- e. Maintenance workers received a permit to install a blind and opened the wrong line. The worker received minor burns requiring medical attention, but not hospitalization.
  - i. The incident did not result in a life-altering event, but could have. This incident would be a Tier 1p incident.
  - ii. The incident cause would have resulted from opening the wrong blind. This would best be reflected by Box #79: Blinding error: wrong location, remove wrong blind.
  - iii. The incident would have likely resulted in exposure to hazardous energy or hot materials. This is best reflected by Box #60: Energy Isolation failure with potential for serious injury from exposure to hazardous energy, toxic materials, or hot materials.
  - iv. The incident required medical treatment and is therefore an OSHA recordable. Mark the incident in the Recordable Injury column.
- f. An entry was made into a confined space where all the flanges were not blinded. The worker was exposed to H<sub>2</sub>S greater than IDLH levels and received medical treatment.
  - i. The incident did not result in a life-altering event, but could have if hydrocarbons had leaked from the open flanges. This would be classified as a Tier 1p incident, due to the potential for serious injury.



- ii. The incident was caused by not properly blinding the open flanges. This is best reflected by Box #79: Blinding Error: Wrong location, remove wrong blind.
- iii. The worker was exposed to IDLH levels of H<sub>2</sub>S. This is best reflected by Box #52: An unprotected H<sub>2</sub>S exposure event greater than IDLH or causing acute exposure symptoms or medical treatment.
- iv. The incident required medical treatment and is therefore an OSHA recordable. This should be reflected in the OSHA Recordable column.
- g. A worker performed work on equipment that was not properly de-energized, nor verified as energy free. The worker was not injured.
  - i. The incident did not result in a life-altering event, but had the potential to. This incident would be classified in Tier 1p.
  - ii. The incident was caused by a failure to verify the equipment as energy free. This is best reflected by Box #74: Failure to verify absence of energy.
  - iii. If the incident had occurred, it may have resulted in exposure to hazardous energy, toxic materials, or hot materials. This is best reflected by Box #60: Energy Isolation failure with potential for serious injury from exposure to hazardous energy, toxic materials, or hot materials.
  - iv. This incident did not cause any injuries and is not an OSHA Recordable. Do not mark the OSHA recordable column.
- h. A loss of primary containment results in a release of condensate, causing a burn that required medical attention but not hospitalization.
  - i. The incident did not result in a hospitalization or life-altering event, but did require medical attention and had the potential to cause hospitalization. This incident would be classified as a Tier 1p.
  - ii. The incident was caused by a loss of primary containment. This is best reflected by box #96: *Mechanical Integrity Loss of Containment*.
  - iii. The incident resulted in a burn from condensate. This is best represented by Box #59: *Any exposure to hot materials where there was a potential for serious burns*.
  - iv. The incident resulted in a single OSHA recordable. Mark the number of OSHA recordables in the 'Recordables' column to the right of the Tier 1p column.