

# Measurement Methods

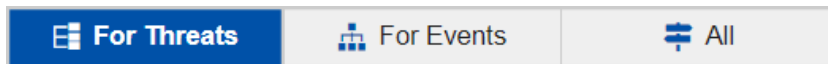
## Likelihood: Define Measurement Methods Overview

You can manage the Likelihood's Measurement Methods on the **LIKELIHOOD OF EVENTS > MEASURE > Measurement Methods** page:

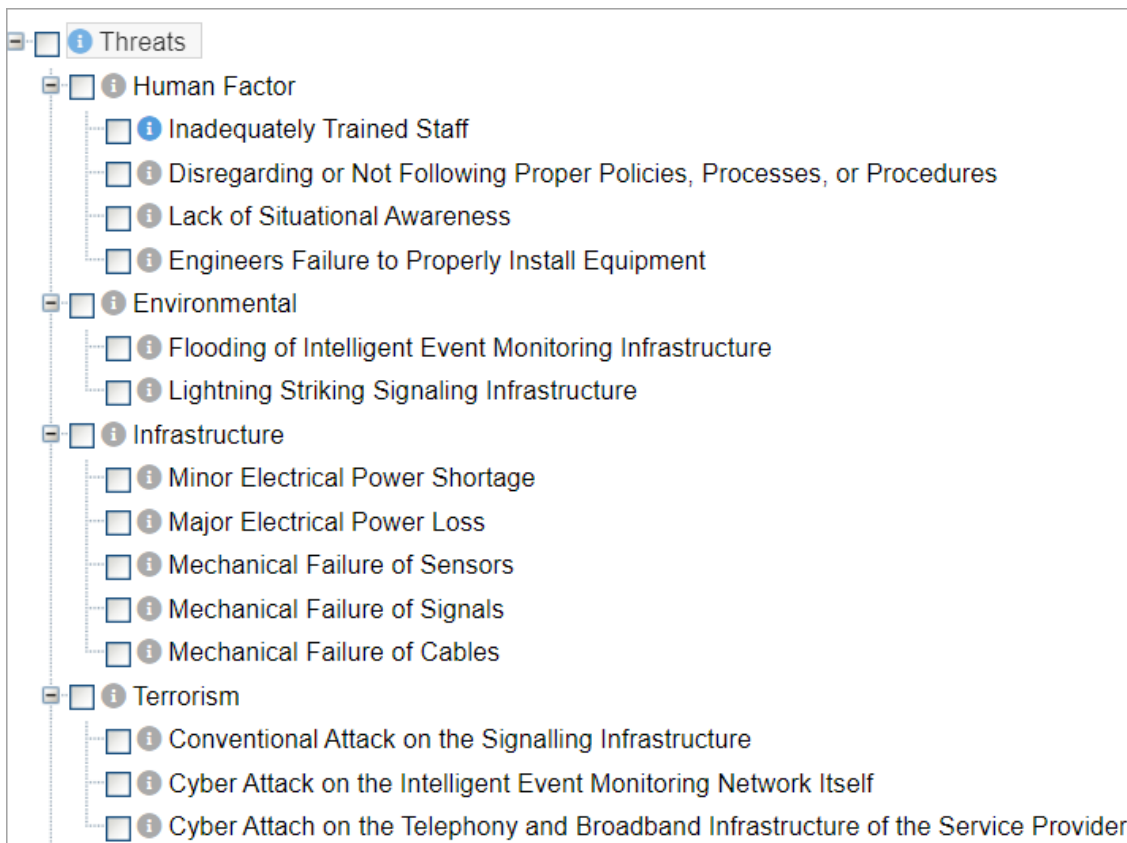
The Measurement Methods for Likelihoods page is where we designate how likelihoods are to be derived or assigned:

1. **For threats** given the **parent threat**
2. **For events** given the **covering threats**
3. **For events** with no **threats**

You can assign the measurement options For Threats and For Events on separate pages, or the same page by selecting from the three tabs:



For example, in the model with threats hierarchy as shown below:



The nodes that have children are the non-covering threats. (e.g. Human Factor, Environmental, ..).

The nodes that have no children are the covering threats (e.g. Inadequately Trained Staff, Disregarding or Not Following Proper Politics., ..)

Depending on the selected tab, the measurement options (Measurement Type, Scale, and other Advanced Options) will be displayed to the right of the threat elements (first column).

- **For Threats** - measurement options are available for the **non-covering threats** to define how to measure the threats below the given non-covering threat.
- **For Events** - measurement options are available for the covering threats to define how to measure the events given the covering threat, and the events with no threats.
- **All** - measurement options are available both for non-covering and covering threats which allow defining the two mentioned above on the same page.

For Threats		For Events		All	Manage Scales
Measurement Methods					
Measure Threats/Events With Respect To		Measurement Type Default (E): Rating Scale	Measurement Scale	Action	Cat...
Threats		Rating Scale	IEM Likelihood Scale	Copy	<input type="checkbox"/>
Human Factor		Rating Scale	IEM Likelihood Scale	Copy	<input type="checkbox"/>
Inadequately Trained Staff		Rating Scale	IEM Likelihood Scale	Copy	<input type="checkbox"/>
Disregarding or Not Following Proper Policies, Processes, or Procedures		Rating Scale	IEM Likelihood Scale	Copy	<input type="checkbox"/>
Lack of Situational Awareness		Rating Scale	IEM Likelihood Scale	Copy	<input type="checkbox"/>
Engineers Failure to Properly Install Equipment		Rating Scale	IEM Likelihood Scale	Copy	<input type="checkbox"/>
Environmental		Rating Scale	Environmental (Wea	Copy	<input type="checkbox"/>
Flooding of Intelligent Event Monitoring Infrastructure		Rating Scale	Environmental (Wea	Copy	<input type="checkbox"/>
Lightning Striking Signaling Infrastructure		Rating Scale	Environmental (Wea	Copy	<input type="checkbox"/>
Infrastructure		Rating Scale	IEM Likelihood Scale	Copy	<input type="checkbox"/>
Minor Electrical Power Shortage		Rating Scale	IEM Likelihood Scale	Copy	<input type="checkbox"/>
Major Electrical Power Loss		Rating Scale	IEM Likelihood Scale	Copy	<input type="checkbox"/>
Mechanical Failure of Sensors		Rating Scale	IEM Likelihood Scale	Copy	<input type="checkbox"/>

The following measurement types are available for evaluating Threats and the Events given Threat:

- Rating
- Direct
- Step Function
- Utility Curve
- Pairwise Comparisons
- Pairwise with Given Likelihood
- Pairwise of Probability

For Likelihood evaluation, we recommend using Pairwise with Given Likelihood instead of Pairwise unless the elements being evaluated are the entire set of possible outcomes (which may not be the case) since the resulting likelihoods will be adjusted to add to 100%.

Depending on the selected tab, the Total Judgments is displayed at the bottom of the page.

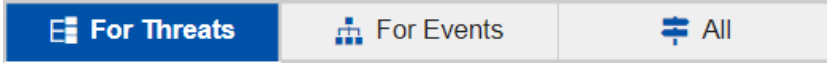
Total Judgments: 107

## Measurement Methods for Evaluating Threats

## Measurement Methods for Evaluating Threats

Measurement Methods for evaluating threats can be found on the **LIKELIHOOD OF EVENTS > MEASURE > Measurement Methods > For Threats** tab.

This is where we designate how threat likelihoods are to be derived or assigned for those threats (elements) in the threats hierarchy given their parent threat (non-covering threat).



**NOTE:** You can also define Measurement Methods for Threats in **All** mode where the measurement methods options For Threats and For Events options are available.

When the **For Threats** tab is selected, only the non-covering threats have available measurement options to the right.

Measurement Methods				
Measure Threats With Respect To	Measurement Type	Measurement Scale	Action	Cat...
Threats	Rating Scale	IEM Likelihood Scal	Copy, Eye, Link	<input type="checkbox"/>
Human Factor	Rating Scale	IEM Likelihood Scal	Copy, Eye, Link	<input type="checkbox"/>
Inadequately Trained Staff				
Disregarding or Not Following Proper Policies, Processes, or Procedures				
Lack of Situational Awareness				
Engineers Failure to Property Install Equipment				
Environmental	Rating Scale	Environmental (Wea	Copy, Eye, Link	<input type="checkbox"/>
Flooding of Intelligent Event Monitoring Infrastructure				
Lightning Striking Signaling Infrastructure				
Infrastructure	Rating Scale	IEM Likelihood Scal	Copy, Eye, Link	<input type="checkbox"/>
Minor Electrical Power Shortage				
Major Electrical Power Loss				
Mechanical Failure of Sensors				
Mechanical Failure of Signals				

In our example, "Threats" (non-covering threat) children: Human Factor, Environmental, and Infrastructure are to evaluate using Rating Scale (IEM Likelihood Scale), as specified on the options to the right of the "Threats" node or their parent.

Measure Threats With Respect To	Measurement Type
Threats	Rating Scale
Human Factor	Rating Scale
Inadequately Trained Staff	
Disregarding or Not Following Proper Policies, Processes, or Procedures	
Lack of Situational Awareness	
Engineers Failure to Properly Install Equipment	
Environmental	Rating Scale
Flooding of Intelligent Event Monitoring Infrastructure	
Lightning Striking Signaling Infrastructure	
Infrastructure	Rating Scale
Minor Electrical Power Shortage	
Major Electrical Power Loss	

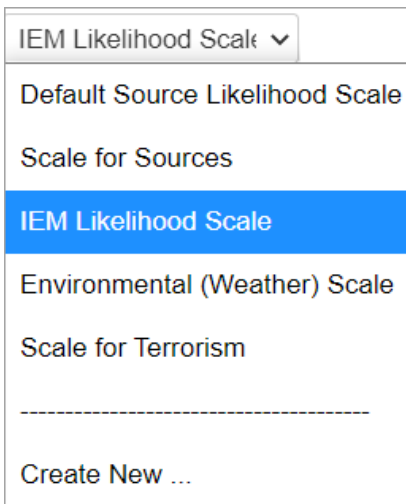
Similarly, the children below "Human Factor" will also be evaluated using the Rating Scale, as specified on the measurement options to the right of Human Factor.


Human Factor	Rating Scale
Inadequately Trained Staff	
Disregarding or Not Following Proper Policies, Processes, or Procedures	
Lack of Situational Awareness	
Engineers Failure to Properly Install Equipment	

You can change the Measurement Type by selecting from the pull-down menu:


Rating Scale	▼
Pairwise with Given Likelihood	
Direct	
Rating Scale	
Step Function	
Utility Curve	
Pairwise Comparisons	
Pairwise of Probabilities	

You can change or create a new measurement scale (if applicable) by selecting from the pull-down:

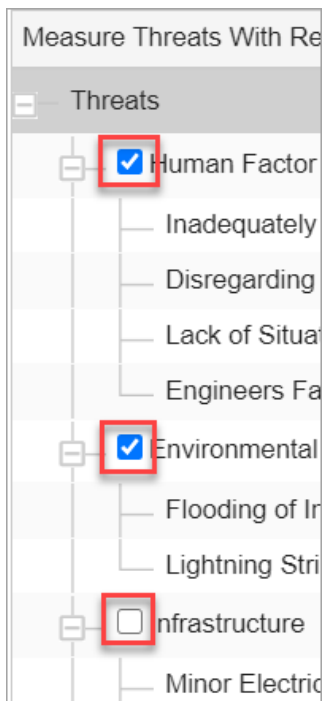


You can edit the currently selected scale by clicking  under the Action column.

You can also copy the measurement options from one non-covering threat to one or more non-covering threats.

Simply click  to the right of the non-covering threat you want to copy.

Checkboxes will appear to the left of the other non-covering nodes. Check the nodes you want to paste the measurement options to.




You can also check all the nodes at the bottom of the page.

Once done, click Proceed.



You can also make a non-covering threat a Category by checking the Category check box.

You can jump to the specific evaluation step of the given covering threat by clicking .

# Measurement Methods for Evaluating Events Given Threats

Measurement Methods for evaluating events given threats can be found on the **LIKELIHOOD OF EVENTS > MEASURE > Measurement Methods > For Events** tab.

This is where we designate how likelihoods are to be derived or assigned for the events given the covering threats in the threats hierarchy.

**NOTE:** You can also define Measurement Methods for Events given Threats in **All** mode where measurement methods options For Threats and For Events options are available.

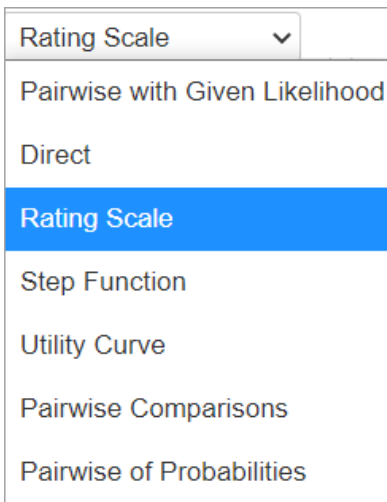
When the **For Events** tab is selected, only the covering threats have available measurement options to the right.

Measurement Methods			Action		Cat...
Measure Events With Respect To	Measurement Type Default: Rating Scale	Measurement Scale	Copy	Eye	
Threats					
Human Factor					
Inadequately Trained Staff	Rating Scale	IEM Likelihood Scal	Copy	Eye	
Disregarding or Not Following Proper Policies, Processes, or Procedures	Rating Scale	IEM Likelihood Scal	Copy	Eye	
Lack of Situational Awareness	Rating Scale	IEM Likelihood Scal	Copy	Eye	
Engineers Failure to Properly Install Equipment	Rating Scale	IEM Likelihood Scal	Copy	Eye	
Environmental					
Flooding of Intelligent Event Monitoring Infrastructure	Rating Scale	Environmental (Wea	Copy	Eye	
Lightning Striking Signaling Infrastructure	Rating Scale	Environmental (Wea	Copy	Eye	
Infrastructure					
Minor Electrical Power Shortage	Rating Scale	IEM Likelihood Scal	Copy	Eye	
Major Electrical Power Loss	Rating Scale	IEM Likelihood Scal	Copy	Eye	
Mechanical Failure of Sensors	Rating Scale	IEM Likelihood Scal	Copy	Eye	

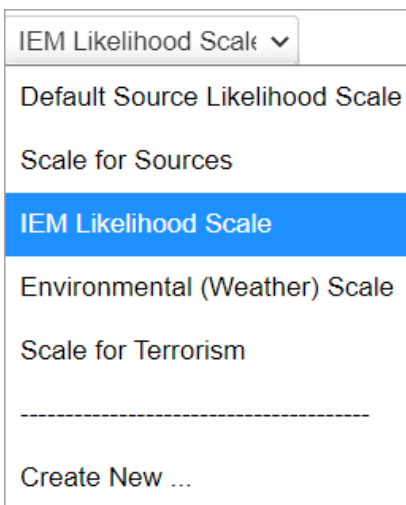
From above, the events given "Inadequately Trained Staff" will be evaluated using the Rating Scale (IEM Likelihood Scale) as specified on the options to the right of this covering threat.

Inadequately Trained Staff	Rating Scale	IEM Likelihood Scal
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You can change the Measurement Type by selecting from the pull-down menu:



You can change or create a new measurement scale (if applicable) by selecting from the pull-down:

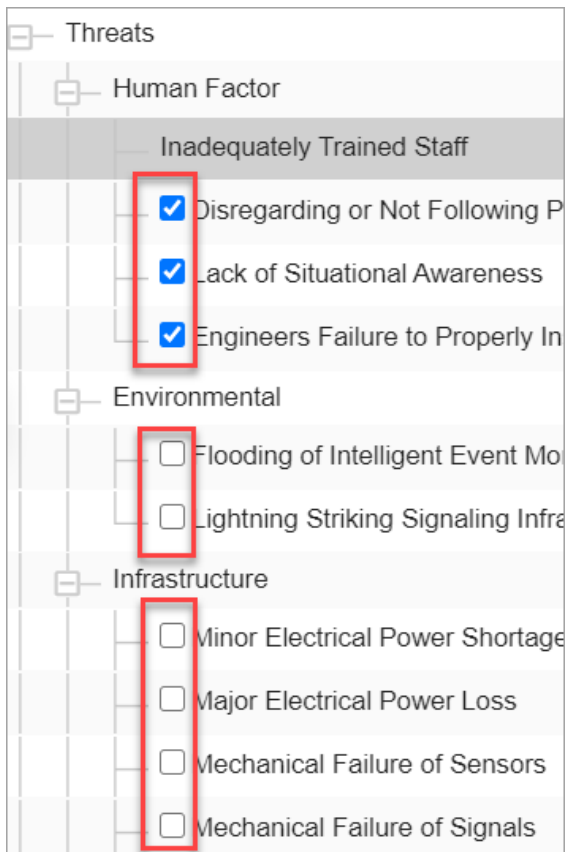


You can edit the currently selected scale by clicking 

You can also copy the measurement options from one covering threat to one or more covering threat(s).

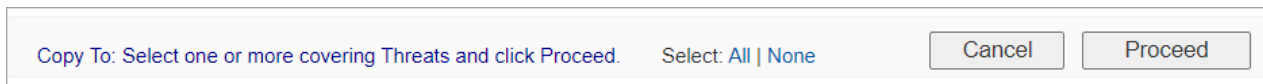
Simply click  to the right of the covering threat you want to copy.

Checkboxes will appear to the left of the other covering nodes. Check the nodes you want to paste the measurement options to.



You can also check all the nodes at the bottom of the page.

Once done, click Proceed.



You can also make a covering threat a Category by checking the Category check box.

You can jump to the specific evaluation step of the given covering threat by clicking 