Quick Reference for Analyzing Reinsurance Contracts

Touchstone Re

Publication Date: June 2023

Revision History

Revision Date	Description
June 2023	Formatting updates.
June 2022	Rebranding.
August 2019	Updated figures: Removed figure 43 and replaced figure 44 with a new image.
June 2019	Formatting updates.
August 2018	Initial publication

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1 Introduction

This is a reference for setting up a variety of contracts in Touchstone Re.

The following discussion also included are summaries of key program term definitions and how they are used by Touchstone Re. This document should be used as supplement to the Touchstone Re online help which is available from the application interface or from the Client Portal.

Only the most common contract types that the Verisk Client Consulting and Support Group (CCSG) has received questions on in the past are covered in this document. New contract types will be added as we receive reader feedback. All questions and comments on improving this document can be sent to TouchstoneReSupport@ air-worldwide.com.

2 Program term definitions

Program terms affect the behavior program and the assignment of losses to a contract.

It is important to understand how the various fields on the **Terms** tab for a Touchstone Re program affect program behavior and contract loss. Several terms appear similar in function but actually behave very differently when determining contract losses.

Retention and limits

Touchstone Re allows users to enter occurrence and aggregate terms for the loss retention and limit values used to model a contract.

Occurrence terms dictate retention and limits on a per-occurrence or per-event basis, while aggregate terms dictate retention and limits on an annual basis (i.e., considering all events in a simulated year). Depending on the type of program selected, not all term fields will be available for use.

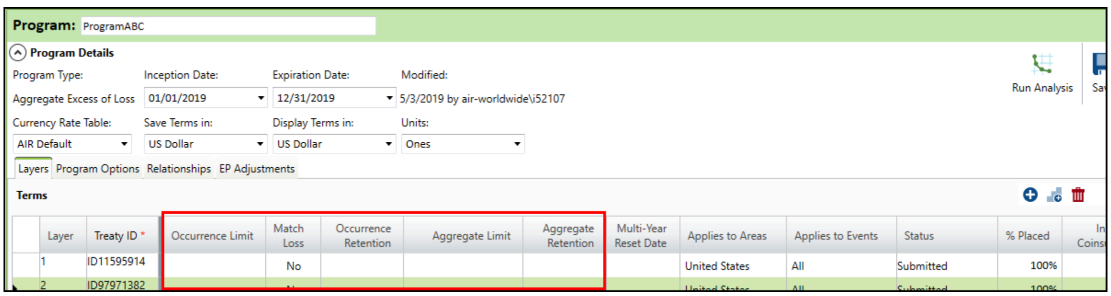


Figure 1. Occurrence and aggregate insurance terms

The occurrence and aggregate terms are applied in the following order:

#	Terms	Definition
1	Occurrence Retention (Occ Ret)	For an event resulting in a company loss, the occurrence retention term is applied first. If the company loss is less than or equal to the occurrence retention term, all the loss is retained and none of the remaining terms are considered.
2	Occurrence Limit (Occ Limit)	If the loss exceeds the retention, Touchstone Re determines the eligible contract loss for that event by applying the occurrence limit term. Any loss exceeding the limit is not considered eligible and is retained.

#	Terms	Definition
3	Aggregate Retention (Agg Ret)[1]	Touchstone Re applies the aggregate retention term to the eligible contract loss, possibly reducing or eliminating the loss altogether. The retention value is reduced by the amount of eligible loss until it is completely exhausted by a single event or over multiple events.
4	Aggregate Limit (Agg Limit)[1]	After the application of the aggregate retention term, any remaining eligible contract loss results in an actual contract loss provided the aggregate limit for the year is not exceeded.

Applies to areas and event filters

The **Applies to Areas** and **Applies to Events** allow you to apply filters to your Touchstone Re programs.

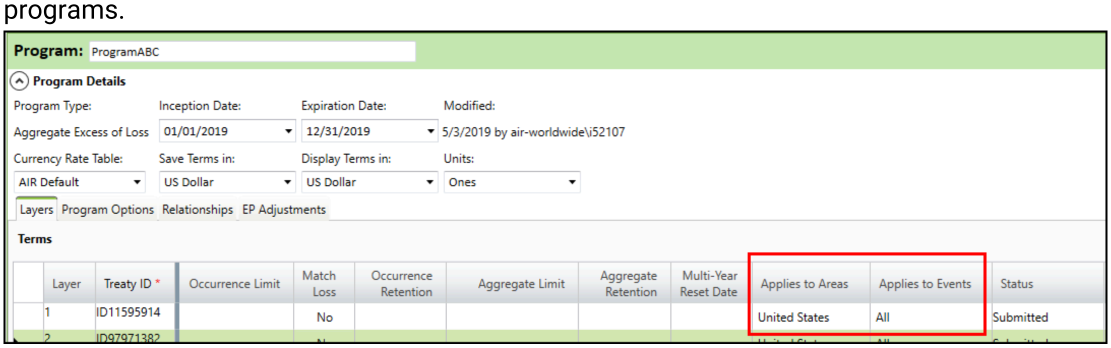


Figure 2. Applies to filters

The **Applies to Areas** dialog box allows you to restrict your program to a specific geographical area and, with pro rata treaties such as quota shares, to specify the ceded percentage on a country, area or subarea basis.

[1] Aggregate terms are not available in Catastrophe Excess of Loss programs. However, you can control the aggregate limit by specifying the number of reinstatements on the layer in the *Reinstate* field. For example, a reinstatement factor of 0 would result in an aggregate limit equal to the occurrence limit.

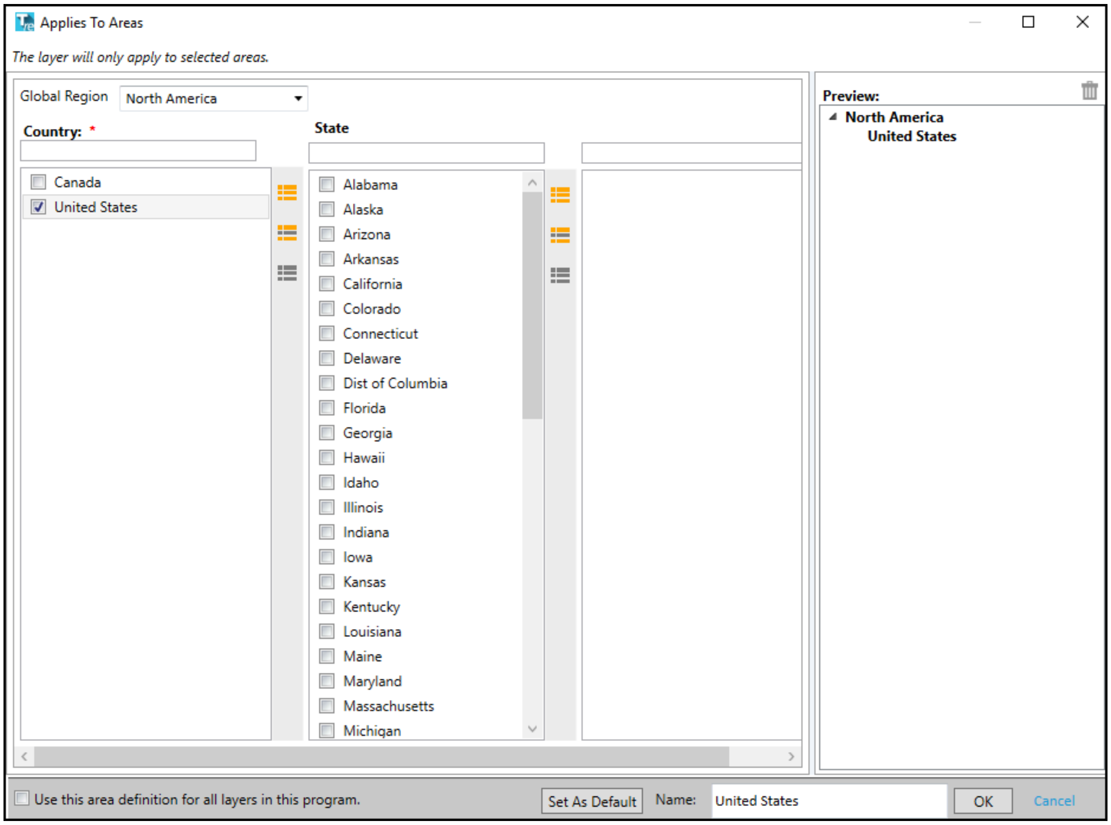


Figure 3. Applies to areas

The ceded percentage determines the proportion of Company Loss assumed by the reinsurance treaty for that geographic area. The **Applies to Events** filter allows you to filter out events not meeting a user-specified criteria or rule. A variety of parameters are supported for earthquake and hurricane events on the **Rules** tab including:

• EQ Depth	• HU Max Landfall Windspeed	• HU Landfall Angle
• EQ Epicenter	• HU Central Pressure	• HU Landfall Criteria
• EQ Magnitude	• HU Carvill Hurricane Index SM (CME Hurricane Index) • HU Landfall Criteria	• HU Radius of Max Winds

Additionally, you can specify a geographic filter based on the epicenter or landfall location of the event. You can filter by a latitude/longitude polygon on the location by *Latitude/Longitude* tab or by specifying an area name, similar to the Applies to Areas filter, on the location *By Area* tab.

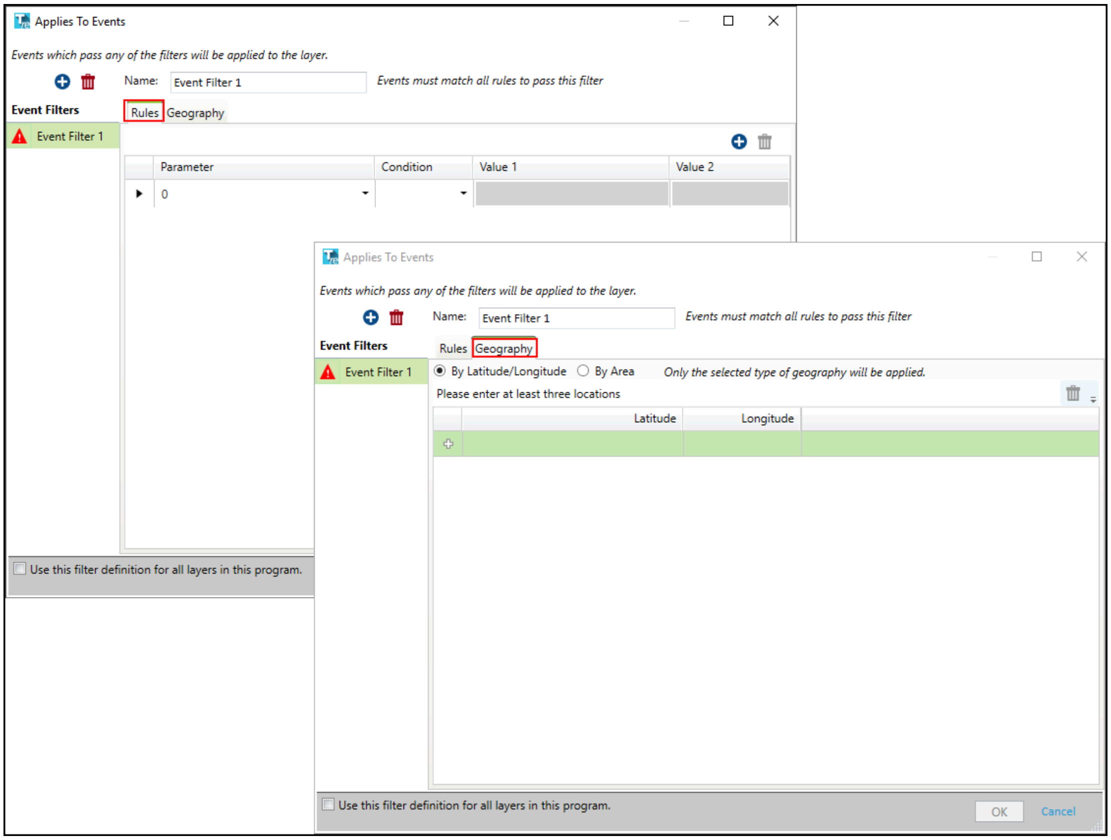


Figure 4. Event filter tabs

Events not meeting the criteria established in the in the event filter are not considered in the analysis.

Percent placed, coinsurance and participation percentages

Percent Placed is the percentage of the treaty that has been placed with reinsurers.

If the treaty is not fully placed, then the insurer does not have coverage for that portion of the treaty and will absorb that portion of the losses as retained loss. Percent placed is not part of the reinsurance contract loss calculation. It does not affect 100%, Gross or Net participation contract loss. It is applied to determine the net retained loss only. Net retained loss = company loss – inuring program loss - (100% contract loss * % placed)

Insurer's Coinsurance is the portion of the losses to the layer that are retained by the cedant. If coinsurance is 10%, then the 10% of the layer loss is retained by the cedant and 90% is available to the reinsurer.

Gross participation, net participation, participation 3 and participation 4 fields can be used to reflect the individual reinsurer's share of each treaty. Therefore, a reinsurer that assumes 20% of a reinsurance contract would enter 20% in the gross participation field. The Net field allows them to reflect a different level of participation if a portion of their gross participation is being retroceded to another company. Participation 3 and 4 are optional user-defined participation percentages which allows the user to specify even more levels of retrocession.

The 100% contract loss is unaffected by these terms; rather, your actual share of the contract loss is determined by scaling down the 100% contract loss by the gross, net participation, participation 3 or participation 4 rates. Each level of participation – 100%, gross, net, 3 and 4 – can be viewed on the Analysis pane.

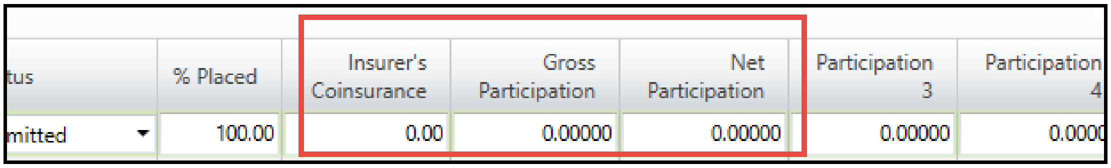


Figure 5. Coinsurance and participation percentages

Note

The insurer's coinsurance field is enabled only for layered treaty structures, such as catastrophe excess of loss, aggregate excess of loss and per risk.

3 Create a catastrophe excess of loss program

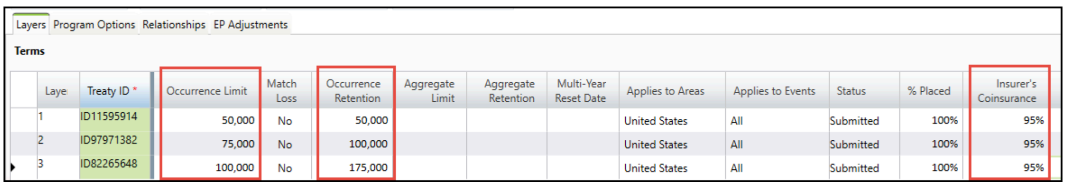
A catastrophe excess of loss reinsurance program, indemnifies the ceding company for that portion of the loss that exceeds the limit of its own retention per event.

To create a three-layered catastrophe excess of loss program with 1 reinstatement and 95% coinsurance (insurer co-participating on 5% of each layer) with the following layer limits and retentions:

- *Layer 1* - $50 million per occurrence limit in excess of $50 million per occurrence retention
- *Layer 2* - $75 million per occurrence limit in excess of $100 million per occurrence retention
- *Layer 3* - $100 million per occurrence limit in excess of $175 million per occurrence retention

Procedure:

1. Select **Companies** > **[Company]** > **Programs** > ⊕
2. Select **Catastrophe Excess of Loss** from the **Add Program Type** dialog box then click **OK**.
3. Enter a unique name into the **Program Name** on the Terms tab.
4. Click **Add Layer** twice to create two new rows, one for the second layer in the program and one for the third.
5. Enter the program terms specified in the example above for each of the layers.
6. Click **Save** to store the newly created program.



Layers | Program Options | Relationships | EP Adjustments

Terms

Laye	Treaty ID *	Occurrence Limit	Match Loss	Occurrence Retention	Aggregate Limit	Aggregate Retention	Multi-Year Reset Date	Applies to Areas	Applies to Events	Status	% Placed	Insurer's Coinsurance
1	ID11595914	50,000	No	50,000				United States	All	Submitted	100%	95%
2	ID97971382	75,000	No	100,000				United States	All	Submitted	100%	95%
3	ID82265648	100,000	No	175,000				United States	All	Submitted	100%	95%

Figure 6. Layer terms

Contract loss examples

Use the program terms described in the previous topic to produce the contract losses for the company ground-up losses.

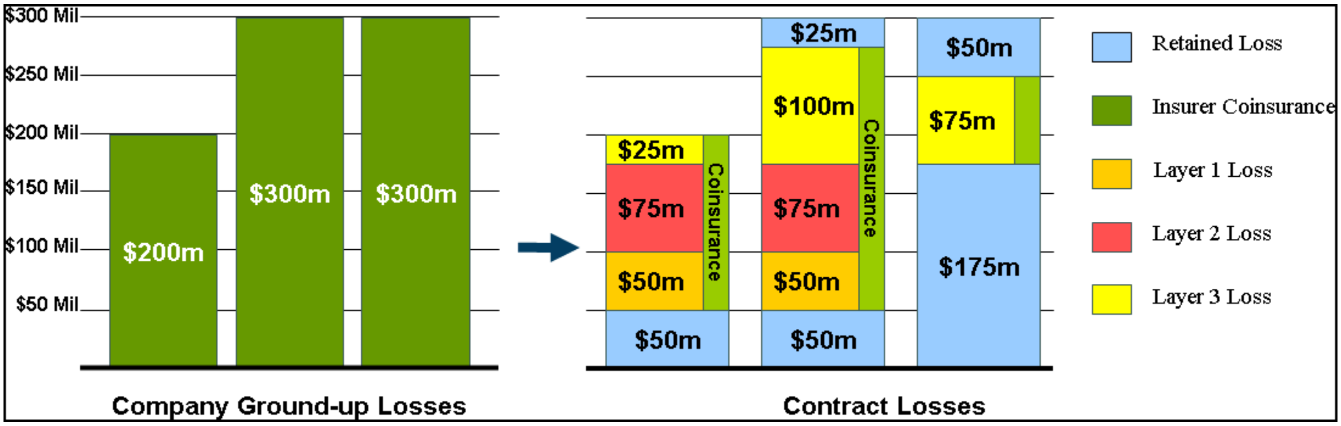


Figure 7. XOL contract losses

- *Event 1: Contract loss of $142.5 M*
  - *Layer 1*– The first $50 million is retained via the Layer 1 occurrence retention term, leaving $150 million in loss, only $50 million of which is eligible Layer 1 loss. The coinsurer absorbs 5% of the $50 million, leaving $47.5 million in losses.
  - *Layer 2*- $75 million of the loss above the $100 million layer retention is eligible Layer 2 loss. The coinsurer absorbs 5% of the $75 million, leaving $71.25 million in losses.
  - *Layer 3*– $25 million of the loss above the $175 million layer retention is eligible Layer 3 loss. The coinsurer absorbs 5% of the $25 million, leaving $23.75 million in losses.
- *Event 2: Contract loss of $213.75 M*
  - *Layer 1*– Layer 1 uses its first and only reinstatement. The first $50 million is retained via the Layer 1 occurrence retention term, leaving $250 million in loss, only $50 million of which is eligible Layer 1 loss. The coinsurer absorbs 5% of the $50 million, leaving $47.5 million in losses.
  - *Layer 2*– Layer 2 uses its first and only reinstatement. $75 million of the loss above the $100 million layer retention is eligible Layer 2 loss. The coinsurer absorbs 5% of the $75 million, leaving $71.25 million in losses.
  - *Layer 3*– Because this layer has 1 reinstatement, $100 million of the loss above the $175 million layer retention is eligible Layer 3 loss. The coinsurer absorbs 5% of the $100 million, leaving $95 million in losses. The amount above this is retained by the insurer.
- *Event 3: Contract loss of $71.25 M*
  - *Layer 1* – Layer 1 has exhausted its reinstatement. No contract loss.
  - *Layer 2* – Layer 2 has exhausted its reinstatement. No contract loss.
  - *Layer 3* – Of the $100 million of the loss above the $175 million layer retention, only $75 million is eligible under the contract. The layer limit was reinstated by event 2, leaving only a $75 million of unused limit. The amount above this is retained by the insurer. The coinsurer absorbs 5% of the $75 million, leaving $71.25 million in losses.

4 Create quota share program

In a quota share contract, a defined percentage of company losses is ceded to the reinsurer on a proportional basis.

To create 20% a quota share program with $20 million occurrence limit and a $50 million aggregate limit:

Procedure:

1. Select **Companies** > **[Company]** > **Programs** > ⊕
2. Select **Quota Share** from the **Add Program Type** dialog box then click **OK**.
3. Enter a unique name into the **Program Name** on the Terms tab.
4. Enter the following program terms:
   - *Occ Limit*: $20 million
   - *Agg Limit*: $50 million

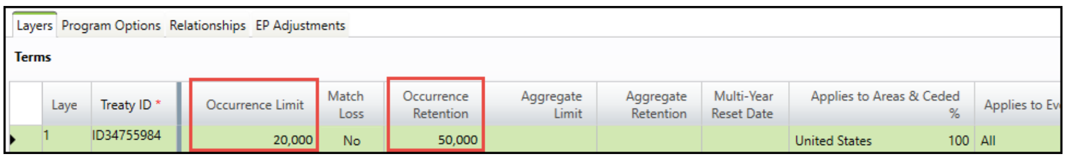


Figure 8. Quota share program terms

5. Click corresponding to the Applies to Areas column to open the Applies to Areas dialog box.
6. Enter 20% in the Ceded % column for the U.S.
7. Click **OK** when you are finished.

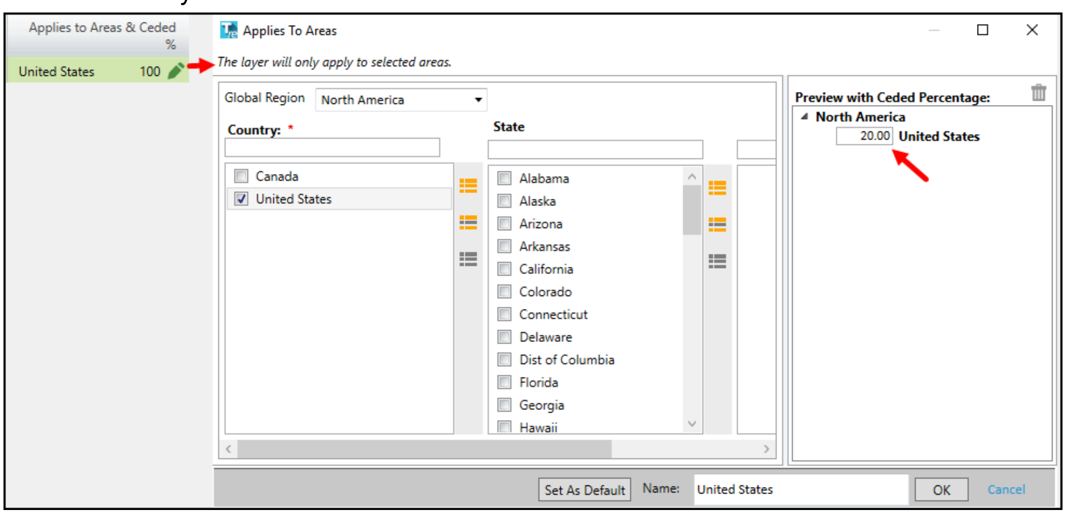


Figure 9. Applies to areas

8. Click **Save** to store the newly created program.

Quota share program loss example

Use the program terms described in the previous topic to produce the contract losses for the company ground-up losses.

Figure 10. Quota share contract losses

- *Event 1*: Contract loss of $20 M

20% of the $120 million company loss capped at the occurrence limit ($20 million).

- *Event 2*: Contract loss of $20 M

20% of the $100 million company loss capped at the occurrence limit ($20 million). After this event, $10m of annual aggregate limit remains.

- *Event 3*: Contract loss of $10 M

20% of the $120 million company loss capped at the occurrence limit results in $20 million of eligible loss under the per occurrence terms. The amount paid as contract loss is reduced to $10 million due to the annual aggregate limit of $50 million.

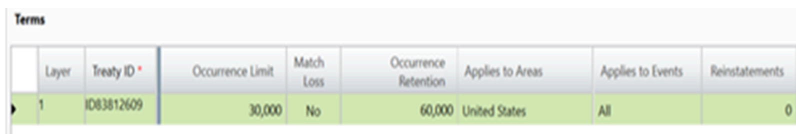
5 Create a drop-down cover

Drop-down contracts allow insurers to lower retention for subsequent events occurring in a contract period after an initial occurrence or aggregate limit has been reached.

To create a drop-down cover contract in which the retention drops from $60 million to $30 million on the exhaustion of a layer:

Procedure:

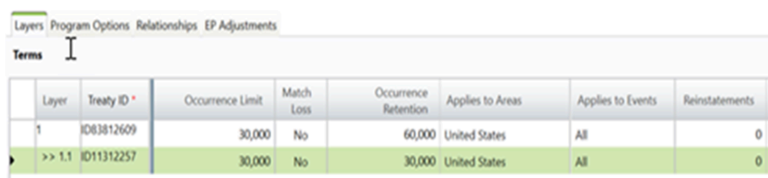
1. Select **Companies** > **[Company]** > **Programs** > ⊕
2. Select **Catastrophe Excess of Loss** from the **Add Program Type** dialog box then click **OK**.
3. Enter a unique name into the **Program Name** on the Terms pane.
4. Enter the following program terms for Layer 1: Occ Limit: $30 million
   - *Occ Limit*: $30 million
   - *Occ Ret*: $60 million


Terms

Layer	Treaty ID *	Occurrence Limit	Match Loss	Occurrence Retention	Applies to Areas	Applies to Events	Reinstatements
1	ID83812609	30,000	No	60,000	United States	All	0

Figure 11. Layer 1 program terms

5. Click **Add Step-Layer** to create a drop-down layer that will be activated after Layer 1 is exhausted.
6. Enter the following program terms for the new step-layer:
   - *Occ Limit*: $30 million
   - *Occ Ret*: $30 million


Layers Program Options Relationships EP Adjustments

Terms

Layer	Treaty ID *	Occurrence Limit	Match Loss	Occurrence Retention	Applies to Areas	Applies to Events	Reinstatements
1	ID83812609	30,000	No	60,000	United States	All	0
>> 1.1	ID11312257	30,000	No	30,000	United States	All	0

Figure 12. Step layer program terms

Drop-down program loss example

Use the program terms described in the previous topic to produce contract losses for the company ground-up losses.

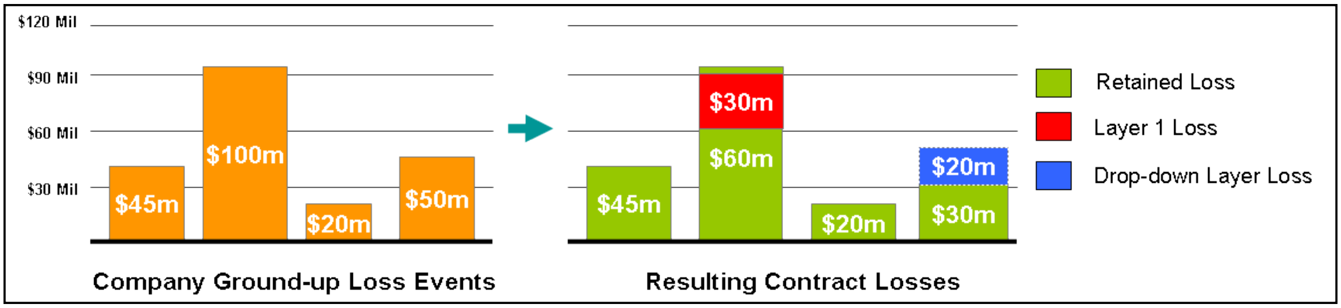


Figure 13. Drop-down cover contract losses

- *Event 1*: No contract loss

The loss falls below the occurrence retention of the primary layer ($60 million).

- *Event 2*: Contract loss of $30 M

The first $60 million is retained via the occurrence retention term. The next $30 million of loss is eligible contract loss and, as there are no aggregate terms, the full amount is paid as a contract loss. The primary layer is exhausted.

- *Event 3*: No contract loss

This loss falls below the occurrence retention of the step-layer ($30 million).

- *Event 4*: Contract loss of $20 M

The first $30 million is retained via the occurrence retention. The next $20 million is eligible contract loss and, as there are no aggregate terms, the full amount is paid as a contract loss.

6 Create industry loss warranties

Industry Loss Warranties (ILWs) are based on the level of industry-insured loss incurred for a particular event. ILWs can cover a single peril, such as hurricane, or multiple perils.

Note

You can also apply parameter-based criteria, such as the location of hurricane landfall or earthquake epicenter, to Industry Loss Warranties.

To create a Florida-only $10 billion Industry Loss Warranty with a $5 million payment:

Procedure:

1. Create a new company to serve as a proxy for the industry exposure in Florida.
2. In the Exposures pane, double-click on **United States** to open exposure detail.
3. Click the **Market Shares %** pane.
4. Select **Wind** from the *Peril* drop-down menu.
5. Select **User specified** from the *Market Share Calculation* drop-down menu.

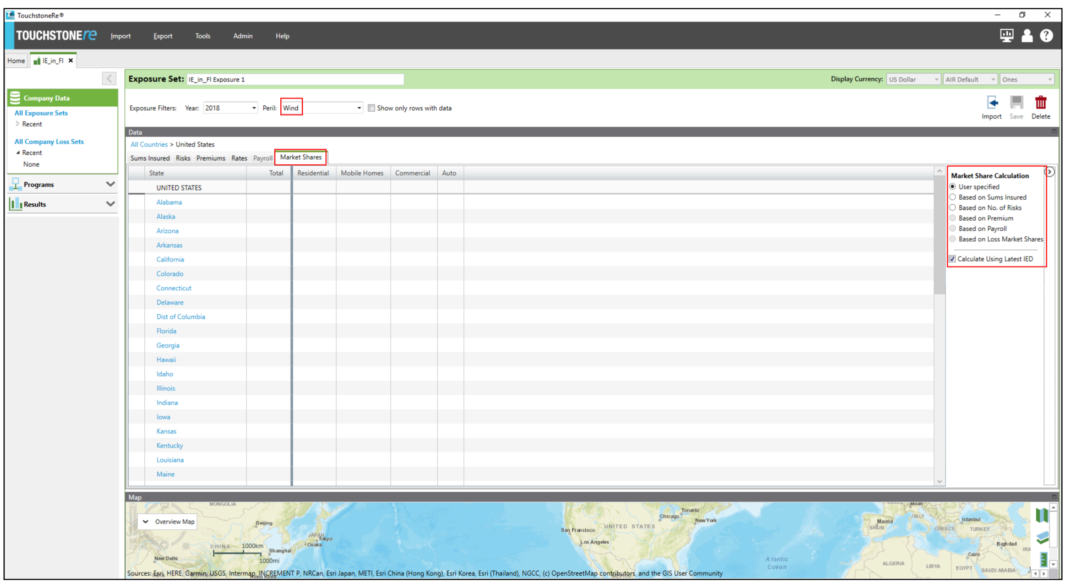


Figure 14. User specified market shares

6. Set the market shares for each of the lines of business in Florida to 100%.
   - We assume a 100% insurance take-up rate for wind in the U.S.
   - For some countries and perils where not all properties are insured for a peril, industry exposure would be represented in Touchstone Re by entering market shares of less than 100%.

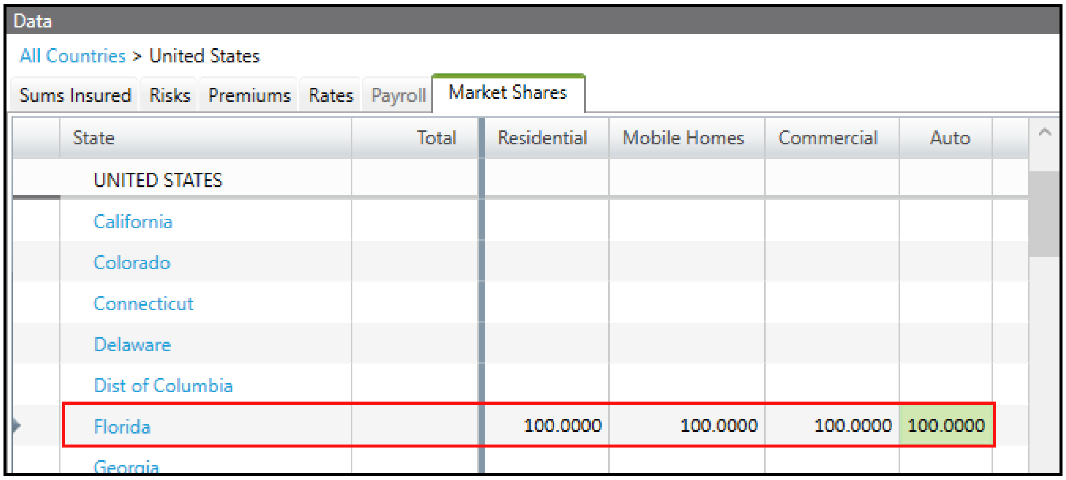


Figure 15. Florida market shares

Note

To include other countries, states or counties in the Industry Loss Warranty, enter industry exposure for that region as User Specified market shares. Verisk has posted recommended industry insurance take-up rates for all modeled perils and regions on the Client Portal

7. Click **Save** to save your changes.
8. Click **Close** to return to the **Company Detail** pane.
9. From the Companies pane, select the **Programs** pane and then click **Add**.
10. Select Industry Loss Warranty from the **Add Program Type** dialog box and then click **OK**.
11. Enter a unique name into the **Program Name** on the **Terms** pane.
12. Enter the following:
    - **Exposure Set**: Use Specified Mkt Shrs
    - **Use**: Specified Market Shares
    - **Year**: Latest

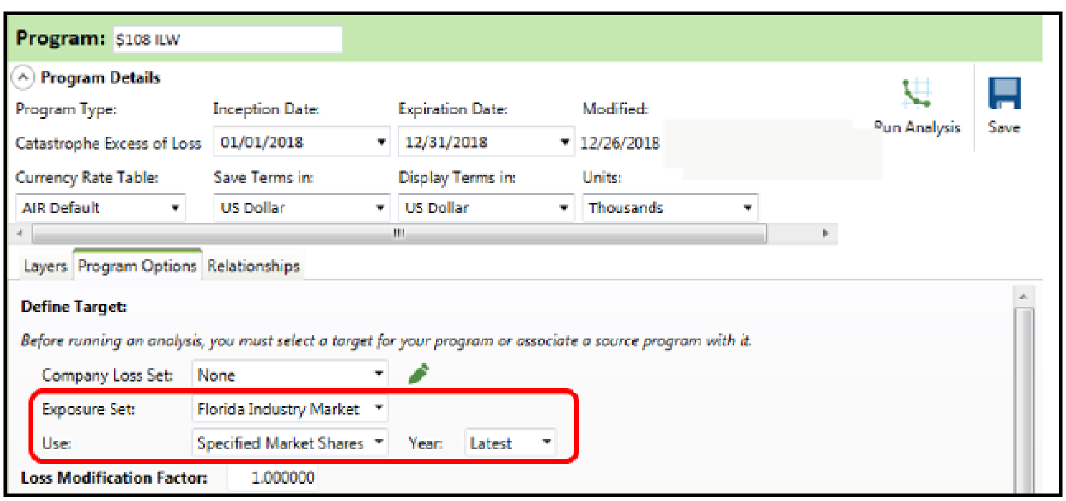


Figure 16. ILW program terms

13. To consider losses in Florida,

- Scroll down to the **Triggers** section.
- Enter a **Company Loss Minimum** of $10 billion.

Note

Use Company Loss Minimum to consider losses in locations where the company has exposure. Use Industry Loss Minimum to consider losses for the entire U.S. and Caribbean for determining whether the trigger condition was met.

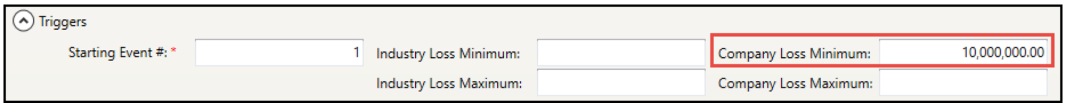


Figure 17. Company loss minimum

14. Click **Save** to store the newly created program.

Industry loss warranties program loss example

Use the program terms and triggers described in the previous topic to produce the Florida losses for the industry losses.

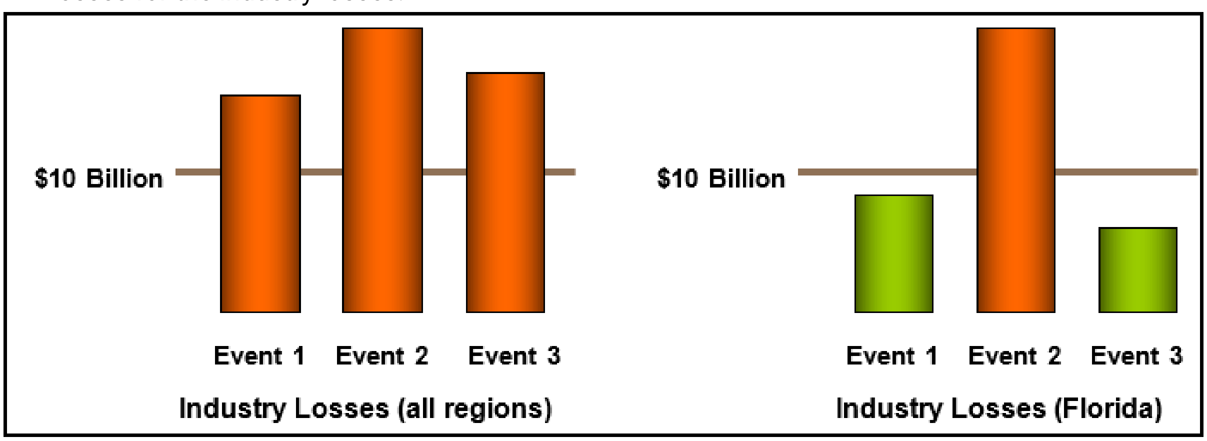


Figure 18. Industry losses in Florida

All three events in exceed $10 billion in industry losses. Only Event 2, however, exceeds $10 billion in losses in Florida. Therefore, the program created in the previous section would only pay out the full $5 million (Occ Limit) on Event 2, which meets the Company Loss Minimum of $10 billion in Florida losses.

7 Parameter-based industry loss warranties

Parameter-based ILWs are based on certain physical event parameters such as the location of hurricane landfall or epicenter and the intensity of the event.

Industry Loss Warranties (ILWs) can cover a single peril, such as hurricane, or multiple perils. Available parameters in Touchstone Re include:

- EQ Depth: Earthquake focal depth in kilometers.
- EQ Epicenter: Earthquake epicenter, where Inside refers to all earthquakes that occur within a country's border and Outside refers to all earthquakes that occur offshore or in a neighboring country.
- EQ Mw: Earthquake moment magnitude.
- HU Carvill Hurricane IndexSM: Carvill Hurricane Index (CME Hurricane Index) value, a continuous value which incorporates factors such as sustained wind speed and the radius of hurricane force winds to determine the potential for damage caused by the storm. For U.S. landfalling hurricanes only.
- HU Central Pressure: Hurricane central pressure at landfall in millibars.
- HU Max Landfall Windspeed: Maximum hurricane wind speed at landfall in miles per hour
- HU Forward Speed: Hurricane forward speed.
- HU Landfall Angle: Hurricane landfall angle measured in degrees from North.
- HU Landfall Criteria: Events which make at least one landfall (Landfall) or none (Bypass)
- HU Radius of Max Winds: Radius of maximum winds.

Create parameter-based ILW

Steps to create a sample parameter-based ILW.

To create a $15 billion Industry Loss Warranty for earthquake events of magnitude 7.0 or greater with an epicenter in the seven state New Madrid region with a $5 million contract payment:

1. Download a current UNICEDE®/2 take-up import rate file.
2. Import the take-up rate file.
3. Create a program.

Download UNICEDE/2 take-up rate import file

First step to create a parameter-based ILW.

For information on UNICEDE/2 files refer to www.unicede.com.

Procedure:

1. Open a browser window and go to Client Portal (www.air-worldwide.com/Support-and-Training/Client-Portal/).
2. Locate the most recent *UNICEDE/2 Take-Up Rate Import* posting, then double-click to open it.
3. Download the zip file(s) associated with the posting per the instructions.

   This UNICEDE/2 file simplifies the process of entering industry-insured exposures as User Specified market shares.

Import the take-up rate file

Second step to create a parameter-based ILW.

Import the file(s) you downloaded in the previous section.

Procedure:

1. Create a new company to serve as a proxy for the industry exposure in the U.S.
2. With the company open in the Company Data pane, select **Import** and then select UNICEDE / 2 from the **Import Type** drop-down.

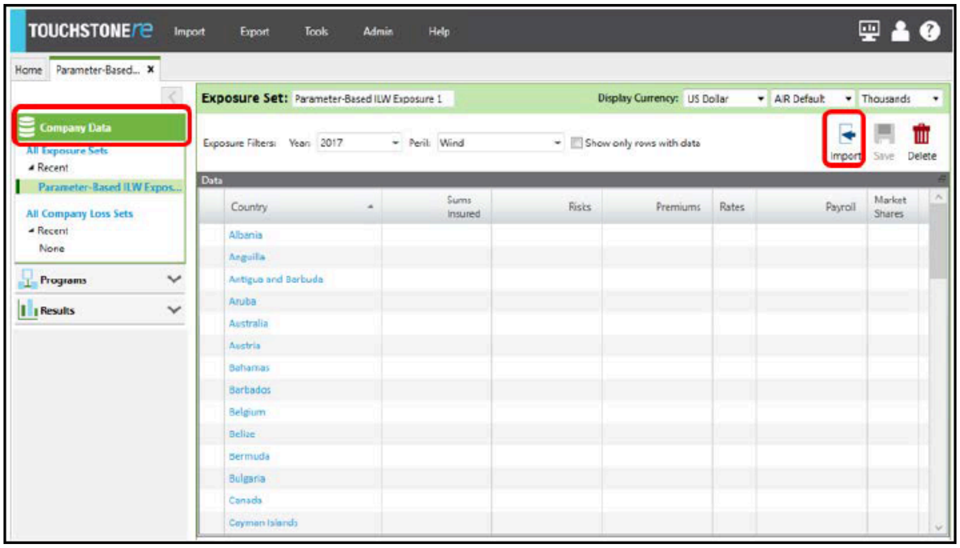


Figure 19. Touchstone Re company data import

3. Click **Browse** to locate and select the take-up rate file.

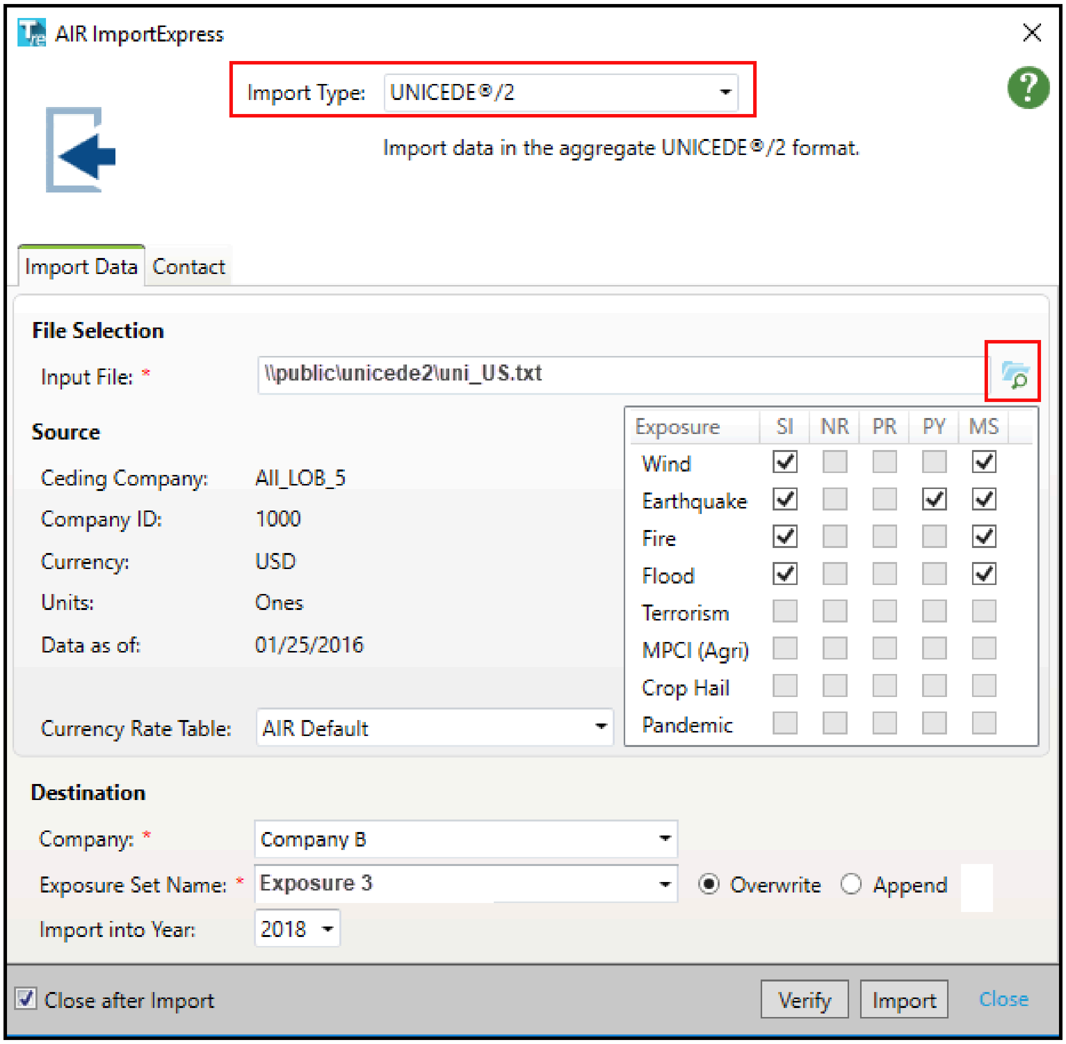


Figure 20. Import UNICEDE/2 take-up rates

4. Enable exposures from the Exposure table.
5. Enter a unique name in Exposure Set Name.
6. Click **Import**.
7. Click **Yes** to update the area totals for the exposure that were imported.
8. Click **Close** to return to the Company Data.

Note

The U.S. take-up rate file allows you to capture all industry insured losses caused by earthquakes occurring in the New Madrid region, regardless of the state in which they are incurred.

Create a parameter-based ILW program

Final step to create a parameter-based ILW.

Download and import the UNICEDE/2 take-up rate import file before continung.

Procedure:

1. From the **Company Data** pane, select the **Programs** tab and then click .
2. Select Industry Loss Warranty from the **Add Program Type** dialog box then click **OK**.
3. Enter a unique program name in the **Program Name** on the **Terms** tab.
4. Enter the following program terms:
    - Occ Limit: $5 million
    - Reinstate: 1 (if applicable)

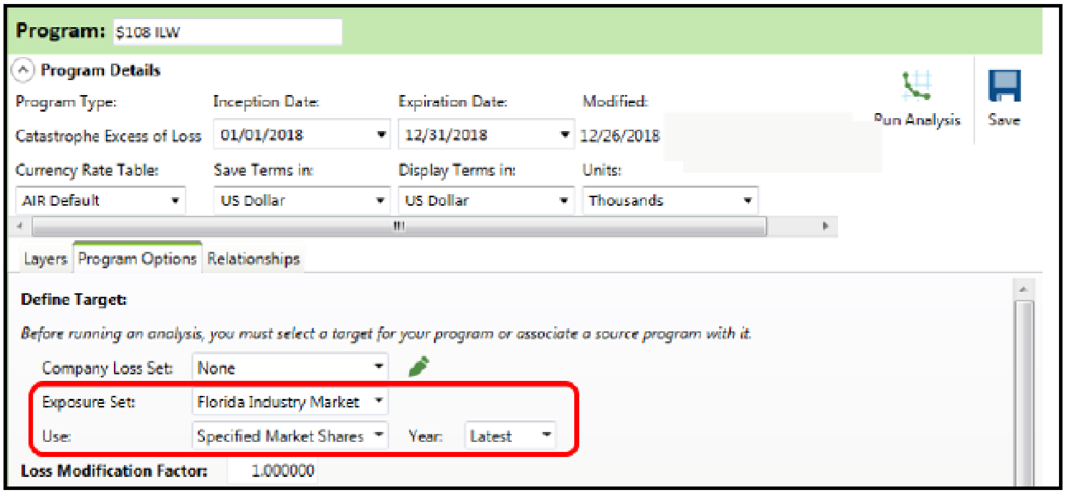


Figure 21. ILW program terms

5. Click corresponding to the Applies to Events .
6. In the **Applies to Events** dialog box, click to create a new filter and define which events should be considered.

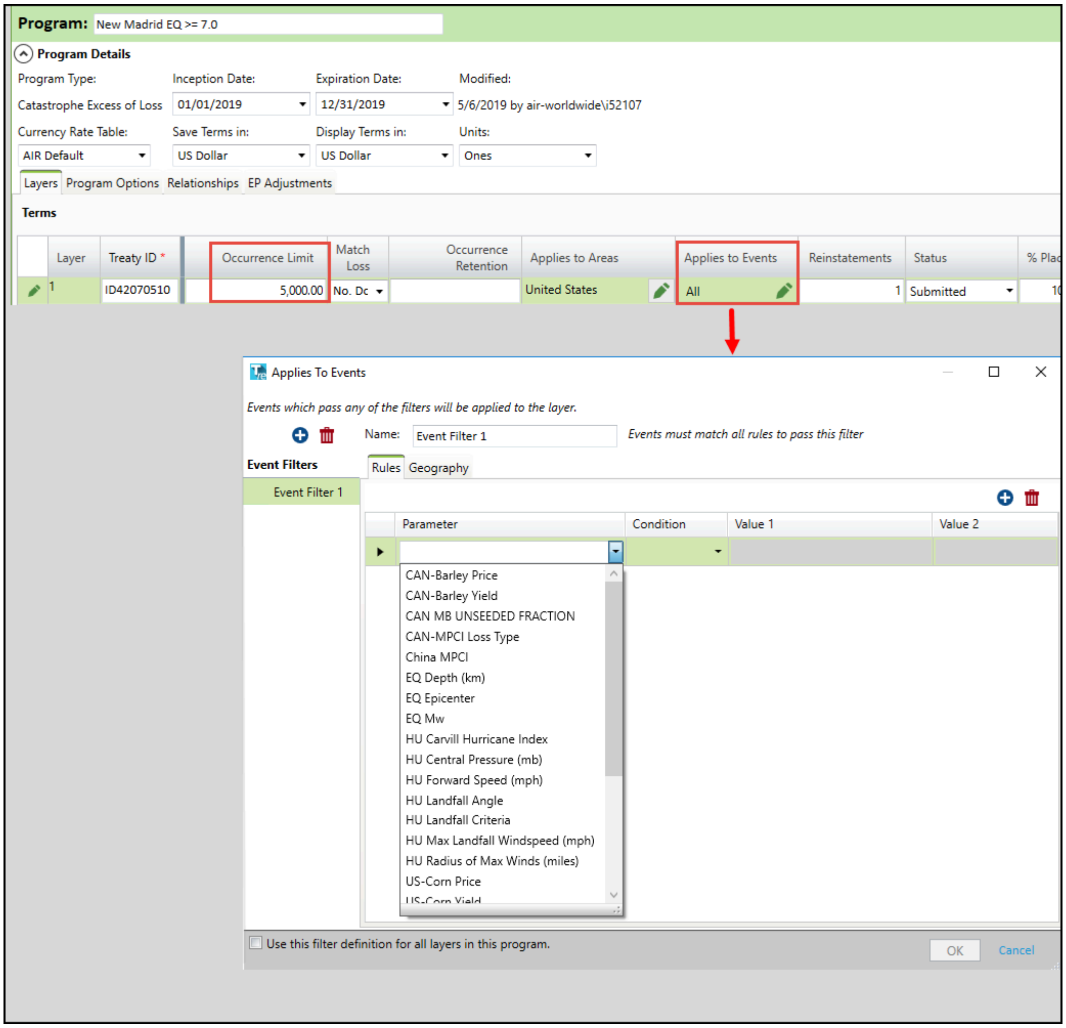


Figure 22. Add new filter

7. On the **Rules** tab, enter a name for the new filter at the top of the **Event Filter** dialog box and configure the following magnitude rule:
   - Parameter: EQ Mw
   - Condition: >=
   - Value 1: 7.0

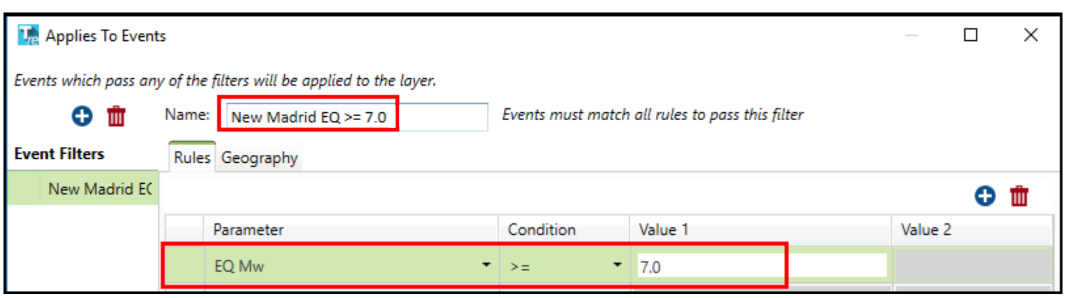


Figure 23. Earthquake magnitude rule

8. Click **OK**.

9. Select the **Geography** tab to set the location for the event.
10. Enable **By Area** from the Geography tab.
11. Select North America from the *Regions* drop-down menu.
12. Select the name of country and state.

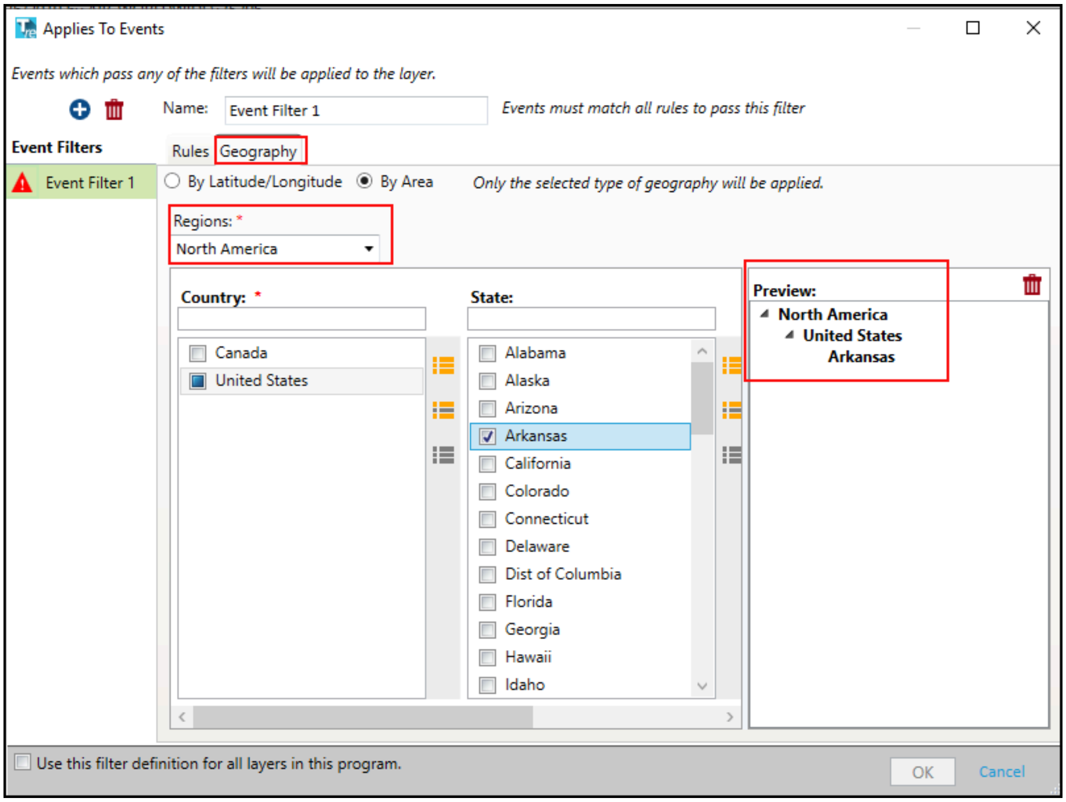
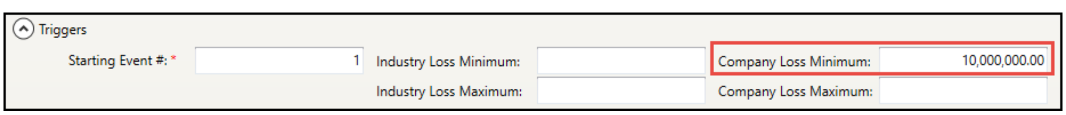


Figure 24. Area name rule

13. Scroll down to United States in the country list then double-click to open the state listing.
14. Toggle on the seven New Madrid states: Arkansas, Illinois, Indiana, Kentucky, Mississippi, Missouri, and Tennessee.
15. Click the *Include* label to display your selections at the top of the list.
16. Click **OK**.
17. Scroll down to the *Triggers* section and enter a Company Loss Minimum of $15 billion.



Note

For this program, you should use the Company Loss Minimum to make Touchstone Re consider the county-level industry take-up rates (U.S. market shares). The Industry Loss Minimum considers state-level industry take-up rates.

Figure 25. Company loss minimum

18. Navigate to the **Program Options** tab and select the exposure set you created and use **Specified Market Shares**.

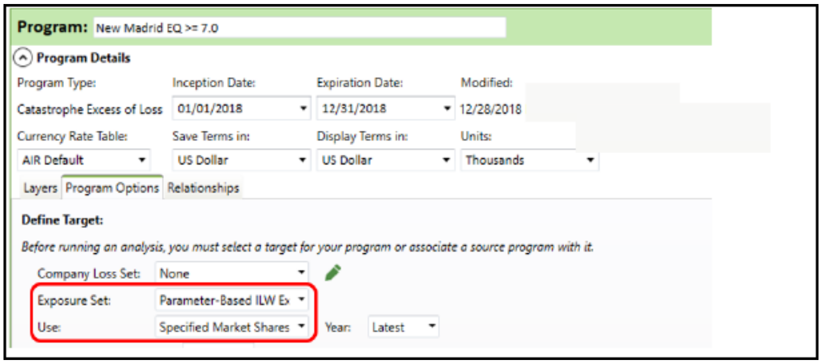


Figure 26. Define target

19. Click **Save** to store the newly created program.

8 Create excess of loss program with (outer) aggregate deductibles

Create this type of program when the aggregate deductible is to be applied prior to the per-occurrence terms.

To create a program with a $200 million occurrence limit and a $100 million occurrence retention in excess of $50 million aggregate loss (or outer aggregate), you must set up two programs:

1. An inuring program
2. A catastrophe excess of loss program

Set up an inuring program

An inuring program will capture the losses absorbed by the aggregate deductible.

An inuring program is set up as a separate program because aggregate terms are considered only after occurrence terms have been applied.

Procedure:

1. Select **Companies** > **[Company]** > **Programs** >
2. Select **Quota Share** from the **Add Program Type** dialog box and then click **OK**.

   This program will inure to the benefit of the catastrophe excess of loss program.
3. Enter a unique name into the **Program Name** on the Terms tab.
4. Enter $50 million into the **Agg Limit**.

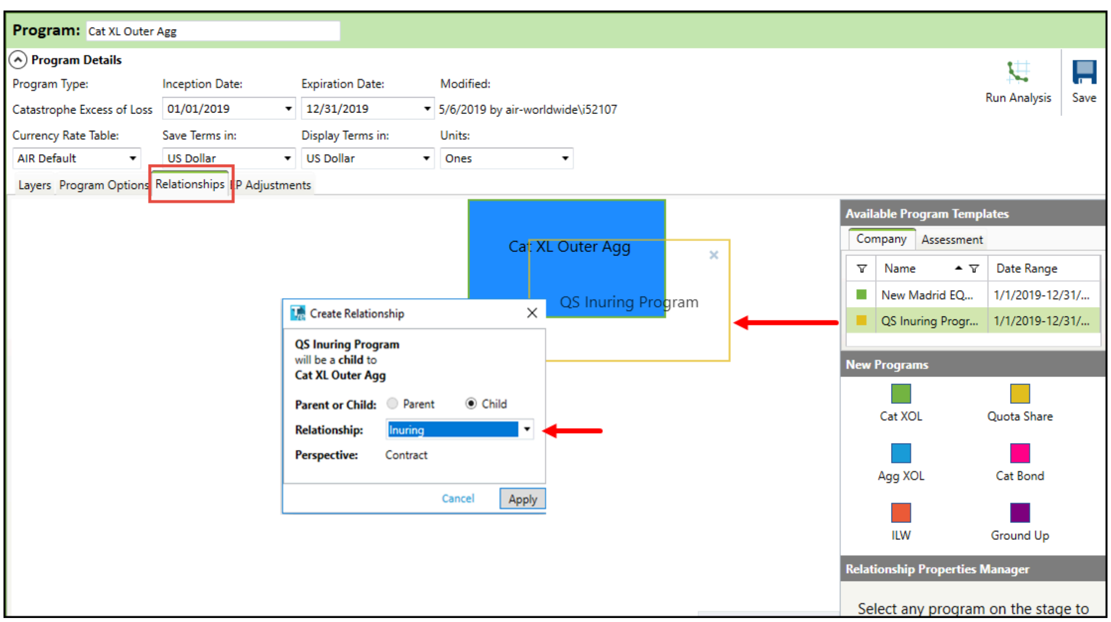


Figure 27. Inuring program terms

5. Click **Save** to store the program.
6. Click **Close** to return to the Company Data pane.

Set up a catastrophe excess of loss program

A catastrophe excess of loss program will capture the losses of the aggregate deductible.

Set up a catastrophe excess of loss program.

Procedure:

1. Select **Companies** > **[Company]** > **Programs** > ⊕
2. Select Catastrophe Excess of Loss from the Add Program Type dialog box and then click **OK**.
3. Enter a unique name into the **Program Name** on the Terms tab.
4. Enter the following program terms:
   - Occurrence Limit: $200 million
   - Occurrence Retention: $100 million

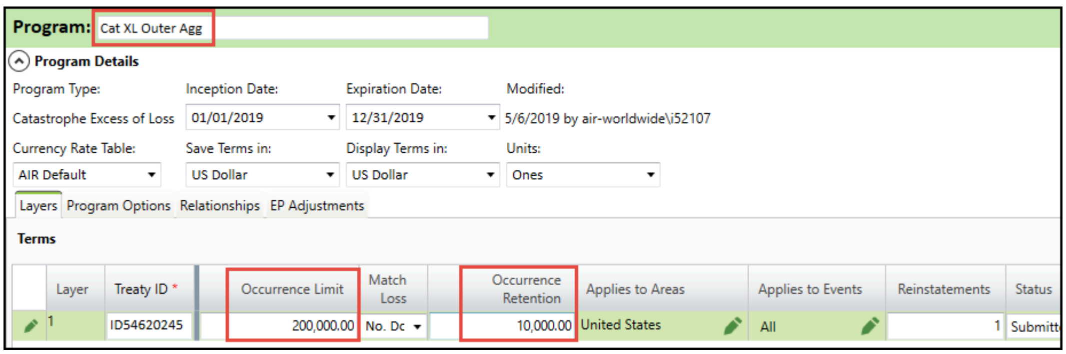


Figure 28. Catastrophe XOL

5. Select the **Relationships** tab, then drag the quota share program created earlier "QS Inuring Program" (from the pane "Available Program Templates") onto the "Cat XL Outer Agg" program.

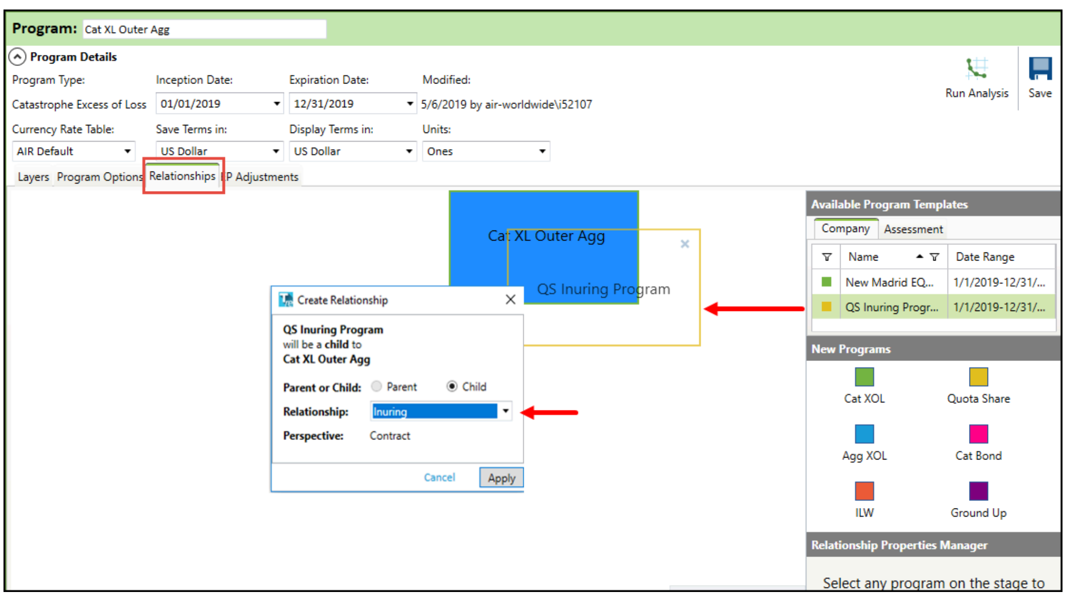


Figure 29. Inuring programs

6. In the **Create Relationships** dialog, select the inuring relationship, contract perspective.

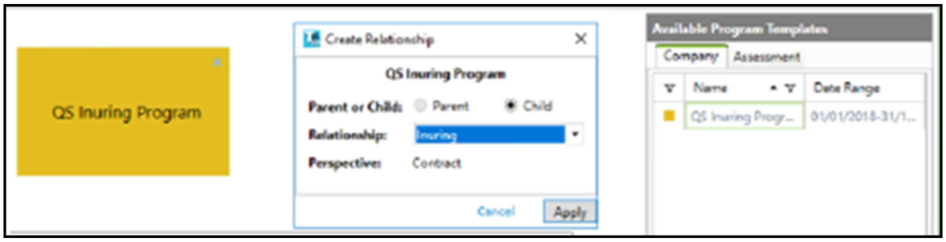


Figure 30. Selecting the relationship between programs

7. Click **Save** to store the newly created program.

Excess of loss program with (outer) aggregate deductibles loss example

Use the occurrence and aggregate terms described in the previous topic to produce the contract losses for the company ground-up losses.

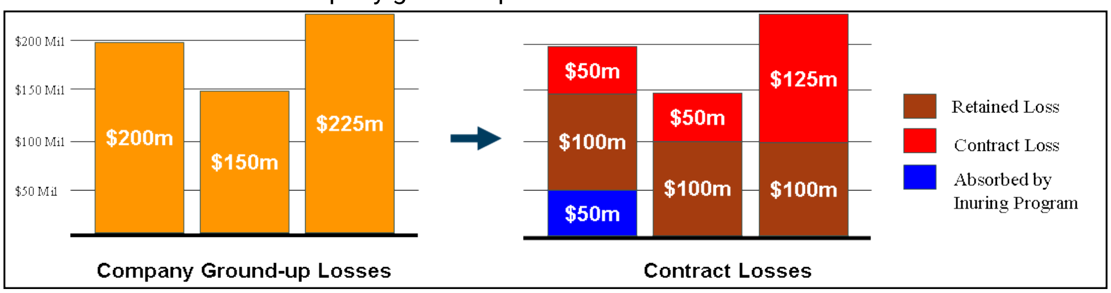


Figure 31. Excess of loss otherwise recoverable contract losses

- *Event 1: Contract Loss of $50 M*

  The inuring quota share contract removes the first $50 million in loss – outside of the occurrence terms – and is exhausted for the remainder of the contract period. The occurrence retention ($100 million) is applied next. The remaining eligible loss is $50 million, which is below the occurrence limit ($200 million), and is paid as contract loss.
- *Event 2: Contract loss of $50 M*

  The first $100 million is retained via the occurrence retention term. The remaining eligible loss of $50 million is paid as a contract loss
- *Event 3: Contract loss of $125 M*

  The first $100 million is retained via the occurrence retention term. The remaining eligible loss of $125 million is paid in its entirety as a contract loss because there is a single reinstatement on the $200 million occurrence limit, capping the aggregate limit at $400 million for the year.

9 Create excess of loss program with otherwise recoverable (inner aggregate) deductibles

The otherwise recoverable amount, sometimes referred to as an inner aggregate deductible, absorbs some amount of loss that would qualify as contract losses if based solely on the per-occurrence retention and limit.

The otherwise recoverable amount is not passed through as reinsured contract loss.

To create a program with a $10 million occurrence limit in excess of $25 million with $15 million otherwise recoverable (or inner aggregate):

Proceedure:

1. Select **Companies** > **[Company]** > **Programs** > ⊕
2. Select Aggregate Excess of Loss from the Add Program Type dialog box then click **OK**.
3. Enter a unique name into the **Program Name** on the Terms tab
4. Enter the following occurrence and aggregate terms:
   - Occ Limit: $10 million
   - Occ Ret: $25 million
   - Agg Limit: $10 million
   - Agg Ret: $15 million

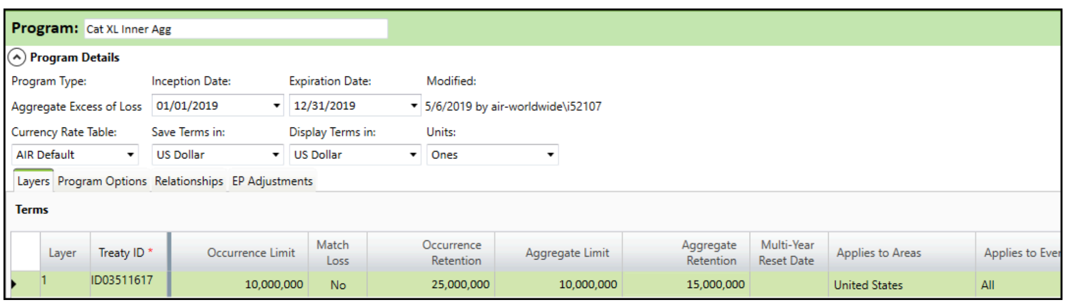


Figure 32. Per event XL excess of amount otherwise recoverable

5. Click **Save** to store the newly created program.

Excess of loss program with otherwise recoverable deductibles example

Examples using program terms described in previous topic to produce the contract losses for the company ground-up losses.

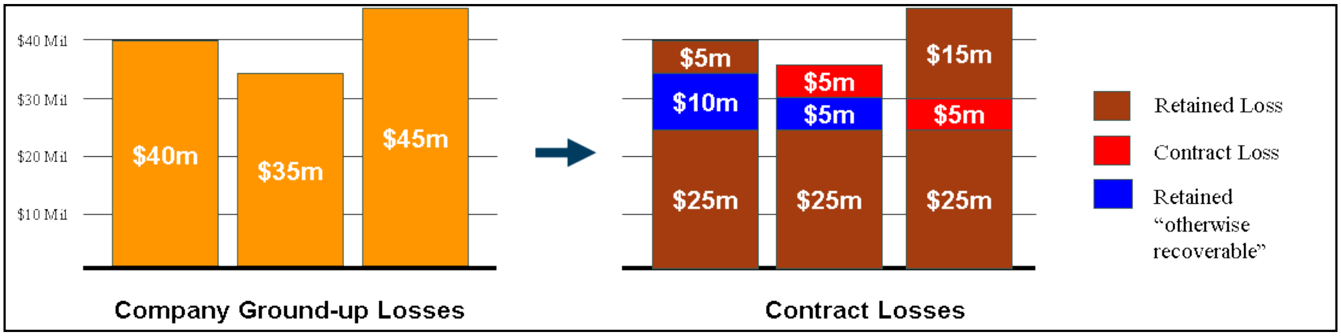


Figure 33. XOL with outer aggregate deductible contract losses

- *Event 1: No contract loss*

  The first $25 million is retained via the occurrence retention term leaving $15 million in loss, only $10 million of which is eligible contract loss. The $10 million in eligible contract loss is absorbed by the aggregate retention term ($15 million), depleting the aggregate retention to $5 million.
- *Event 2: Contract loss of $5 M*

  The first $25 million is retained via the occurrence retention term leaving $10 million in eligible contract loss. The first $5 million in eligible contract loss is absorbed by the remaining aggregate retention ($5 million) – exhausting it – and the remaining $5 million is paid as a contract loss.
- *Event 3: Contract loss of $5 M*

  The first $25 million is retained via the occurrence retention term leaving $10 million in eligible contract loss. However, only the first $5 million can be paid because of the aggregate limit ($10 million) cap for the year.

10 Franchise deductible

A franchise deductible, otherwise known as a "disappearing deductible," is a per-occurrence loss threshold that must be reached before a contract loss will be paid.

Unlike a typical deductible, however, the ultimate reinsured loss is not reduced by the franchise deductible amount.

Create per-event excess of loss programs with franchise deductibles

Steps to create a per-event excess of loss program.

To create a per-event excess of loss program, use a $300 million occurrence limit and a $100 million franchise deductible.

Procedure:

1. From the **Company Data** pane select the **Programs** tab then click ⊕.
2. Select Catastrophe Excess of Loss from the **Add Program Type** dialog box then click **OK**.
3. Enter a unique name into the *Program Name* on the **Terms** tab.
4. Enter the following program terms:
   - Occ Limit: $300 million
   - Reinstate: 0

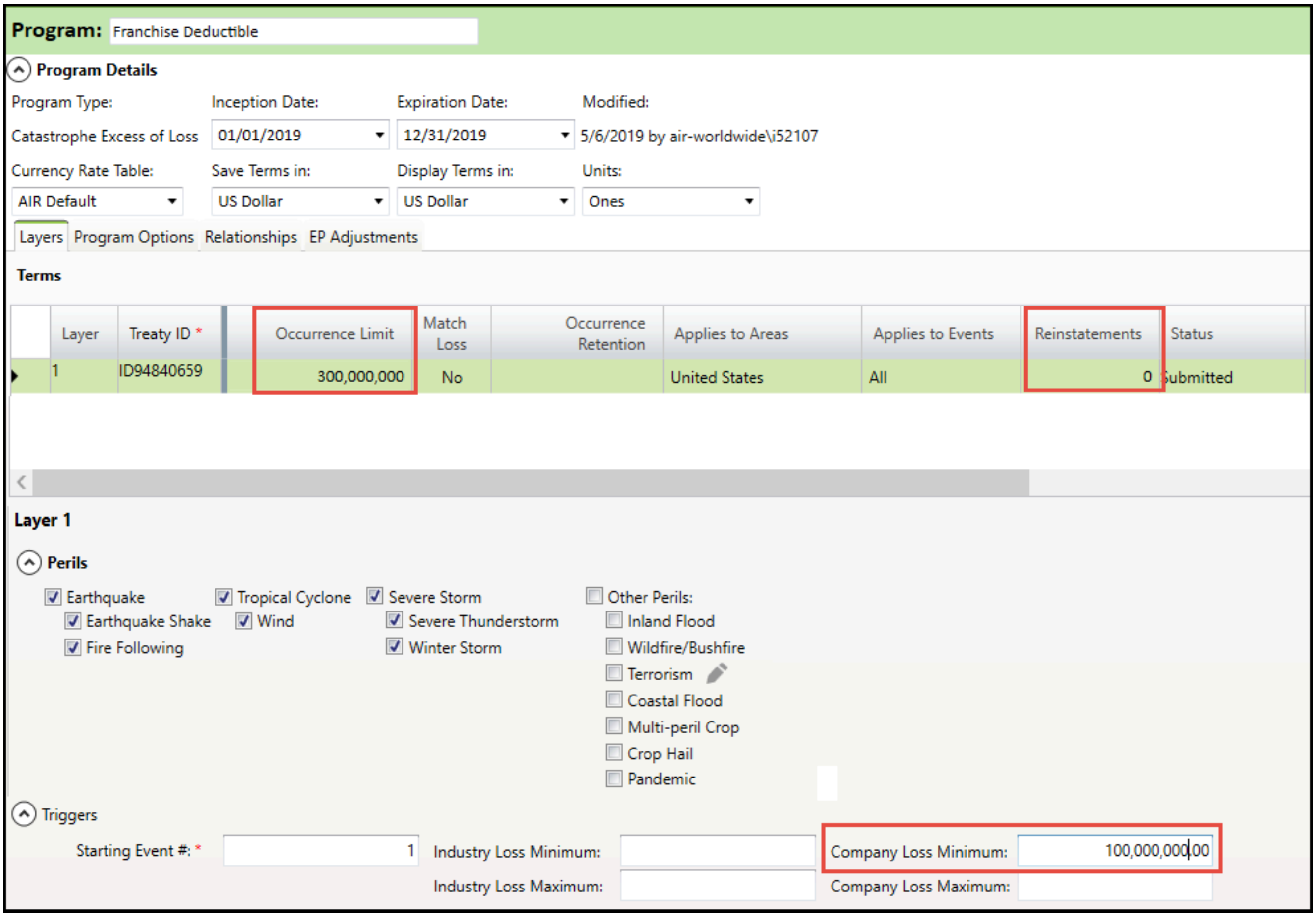


Figure 34. Franchise deductible program terms

5. Scroll down to the **Triggers** section and enter a Company Loss Minimum of $100 million.

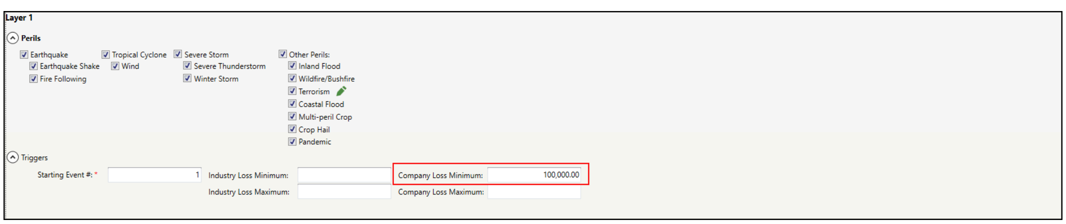


Figure 35. Franchise deductible triggers

6. Click **Save** to store the newly created program.

Franchise deductible program loss example

Use the program terms described in the previous topic to produce the contract losses for the company ground-up losses.

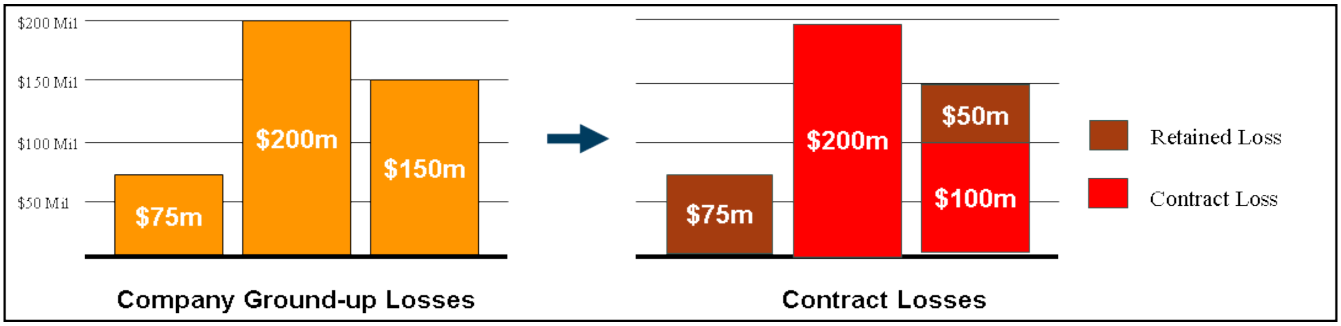


Figure 36. Franchise deductible contract losses

- *Event 1: No contract loss*

  This event falls below the trigger criterion ($100 million); therefore, all loss is retained.
- *Event 2: Contract loss is $200 M*

  This event meets the trigger criterion ($100 million). Since there is no occurrence retention, the entire $200 million is eligible contract loss as the occurrence limit is $300 million. There is no aggregate retention term so the entire loss is paid as a contract loss.
- *Event 3: Contract loss is $100 M*

  The event meets the trigger criterion ($100 million). The entire $150 million is eligible as contract loss; however, since there are no reinstatements on the occurrence limit ($300 million), the contract loss is capped at $100 million.

11 Reverse franchise deductible

A reverse franchise deductible is a per-occurrence loss ceiling that must not be exceeded for a contract loss to be paid.

Like a franchise deductible, the ultimate reinsured loss is not reduced by the franchise deductible amount.

Create per-event excess of loss programs with reverse franchise deductibles

Steps to create a per-event excess of loss program.

To create a per-event excess of loss program, use a with $300 million occurrence limit and a $100 million reverse franchise deductible.

Procedure:

1. From the all **Programs** pane, click **New**.
2. Select **Catastrophe Excess of Loss** from the **Add Program** dialog.
3. Enter a unique name into the **Name** field, then click **OK**.
4. Enter the following program terms:
   - **Occurrence Limit**: $300 million
   - **Reinstatements**: 0

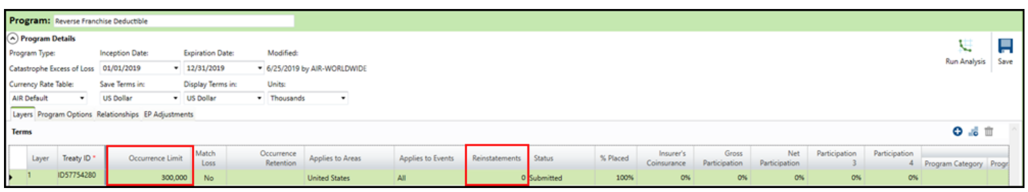


Figure 37. Franchise deductible program terms

5. Under the **Triggers** section on the **Layers** tab, enter a **Company Loss Maximum** of $100 million.
6. Click **Save** to store the newly created program.

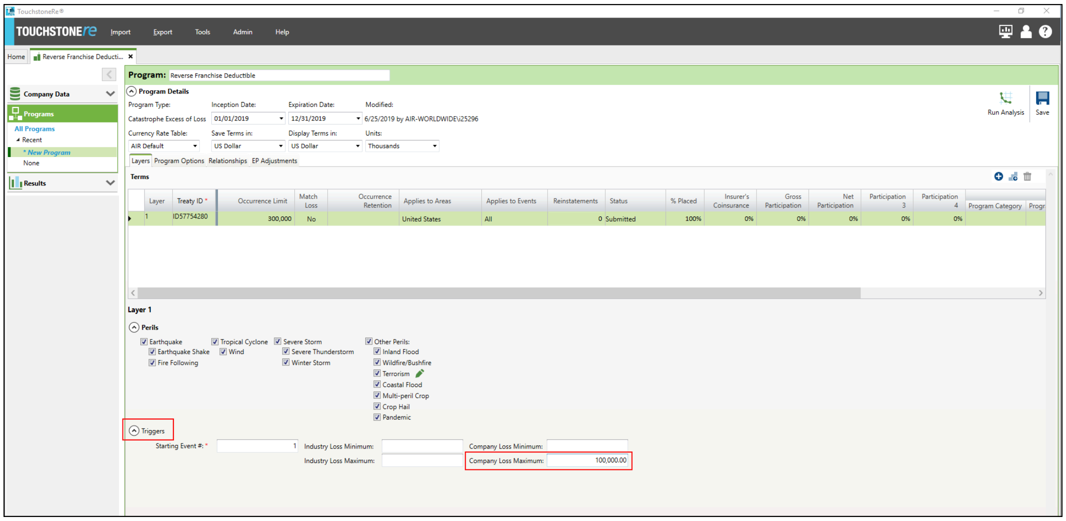


Figure 38. Franchise deductible triggers

Per-event excess of loss programs with reverse franchise deductibles example

Use the program terms described in the previous topic to produce the contract losses for the company ground-up losses.

A sample event loss of $100 million has been used.

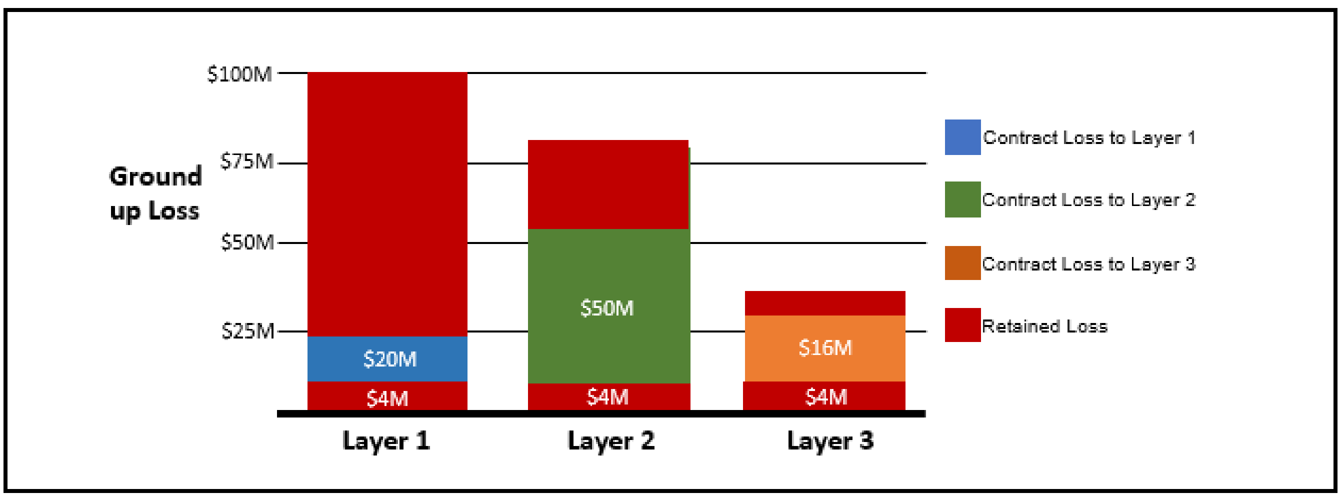


Figure 39. Ground up & contract loss for each layer in cascading structure

- *Layer 1: $20 million contract loss*

  The retention of the first layer is applied to the event of $100 million, reducing this loss to $96 million. This loss is limited to $20 million after applying layer 1 occurrence limit, therefore Layer 1 is eligible to $20 million contract loss.
- *Layer 2: $50 million contract loss*

As the loss feeds into layer 2, the loss from layer 1 is removed before the terms of layer 2 are applied. The loss feeding into layer 2 is $100 million - $20 million which leaves a ground up loss of $80 million entering layer 2.

After applying the occurrence retention of $4 million, this reduces the loss to $76 million. The limit of layer 2 is applied so that $50 million is eligible for contract loss for layer 2.

- *Layer 3: $16 million contract loss*

  As the loss feeds into layer 3, the loss from layer 2 and 1 is removed before the terms of layer 3 are applied. The loss feeding into layer 3 is $100 - $50 - $20 which leaves a ground up loss of $30 million entering layer 3.

  After applying the occurrence retention of $4 million, this reduces the loss to $26 million. This loss is limited to $16 million after applying the layer 3 occurrence limit. Layer 3 is eligible to $16 million contract loss.

12 Cascading structures

Cascading layers are structured in a way that when the limit of a previous layer is exhausted, the next layer drops down in its place.

These structures can be modeled in Touchstone Re using the Inuring functionality that allows losses outside of the layer (below the retention and above the limit) to feed into other programs and layers.

By inuring each layer to another, the losses from the previous layer will be removed before applying the next set of layering terms.

Create a cascading structure

Steps to create a program with the following three layers that cascade.

Layers to include in this program:

- $20 million in excess of $4 million
- $50 million in excess of $4 million
- $16 million in excess of $4 million

Procedure:

1. Navigate to the **All Programs** tab.
2. Select ⊕ to create a new program.
3. Select **Catastrophe Excess** program from the drop-down.
4. Enter the following terms for the first layer:
   - *Occurrence limit*: $20 Million
   - *Occurrence retention*: $4 Million

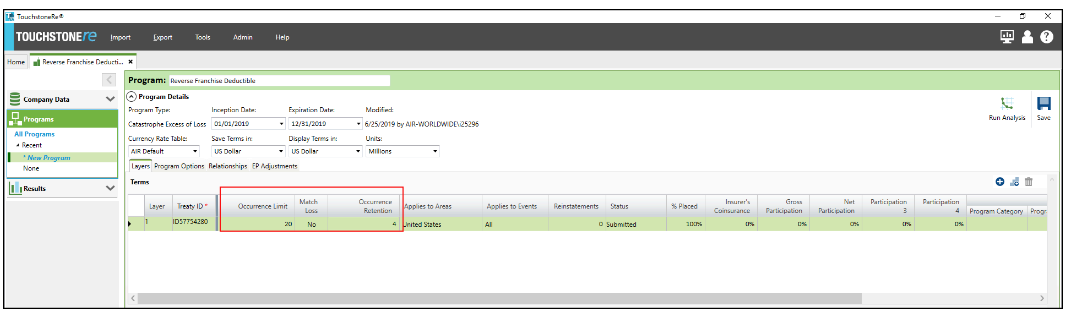


Figure 40. CAT XOL Program for each individual layer

5. Repeat steps 2, 3 and 4 for the other two layers by selecting a **Catastrophe Excess Program** for layer 2 and layer 3 (separately).
6. Click **Save**.

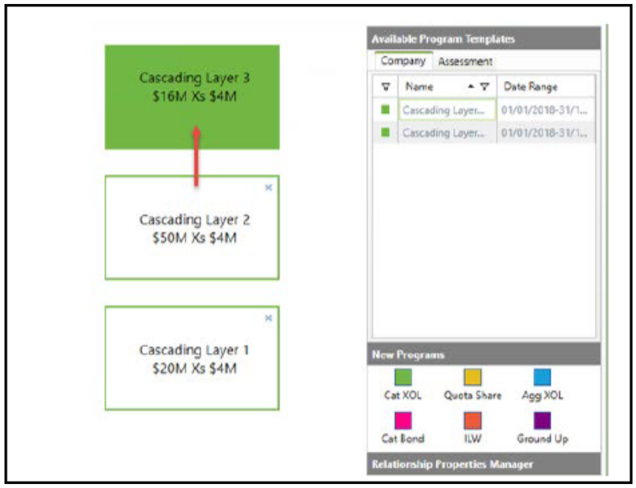


Figure 41. Drag-and-drop programs onto one another to define relationship

7. Within the final layer structure program, select the **Relationships** tab on Layer 3. Within this tab, drag the Layer 2 program on top of the Layer 3.

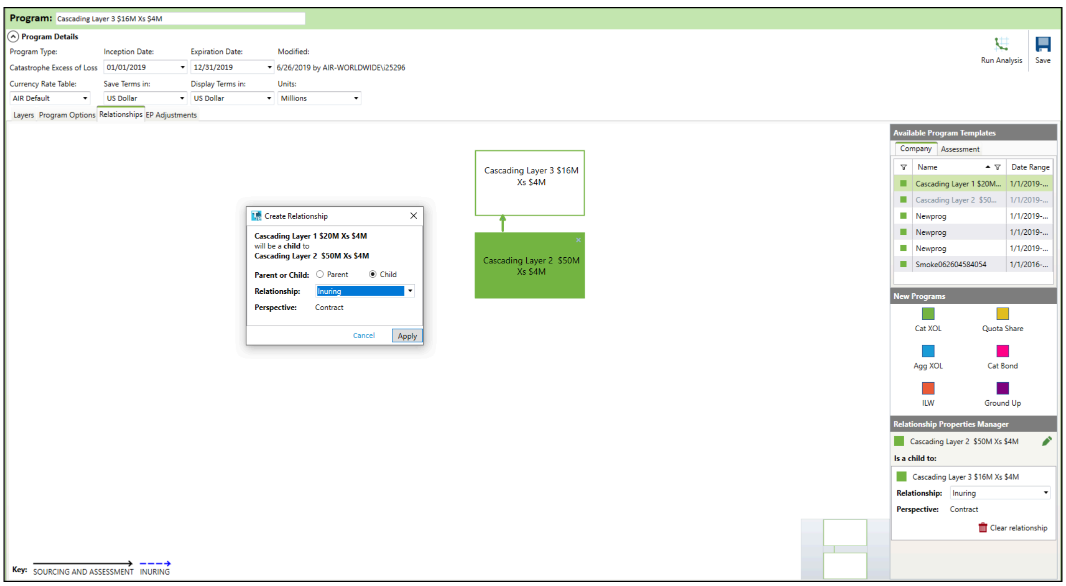


Figure 42. Create relationship invoked once program dropped onto another

8. Drag layer 1 on top of layer 2 and inure to the benefit of layer 1 by defining its relationship.
9. Select to inure to the benefit of Layer 2 by defining the relationship and perspective.

Note

Each layer has a relationship with another layer, the arrow indicates the flow of loss. The dotted line between layers below indicates losses are inuring.

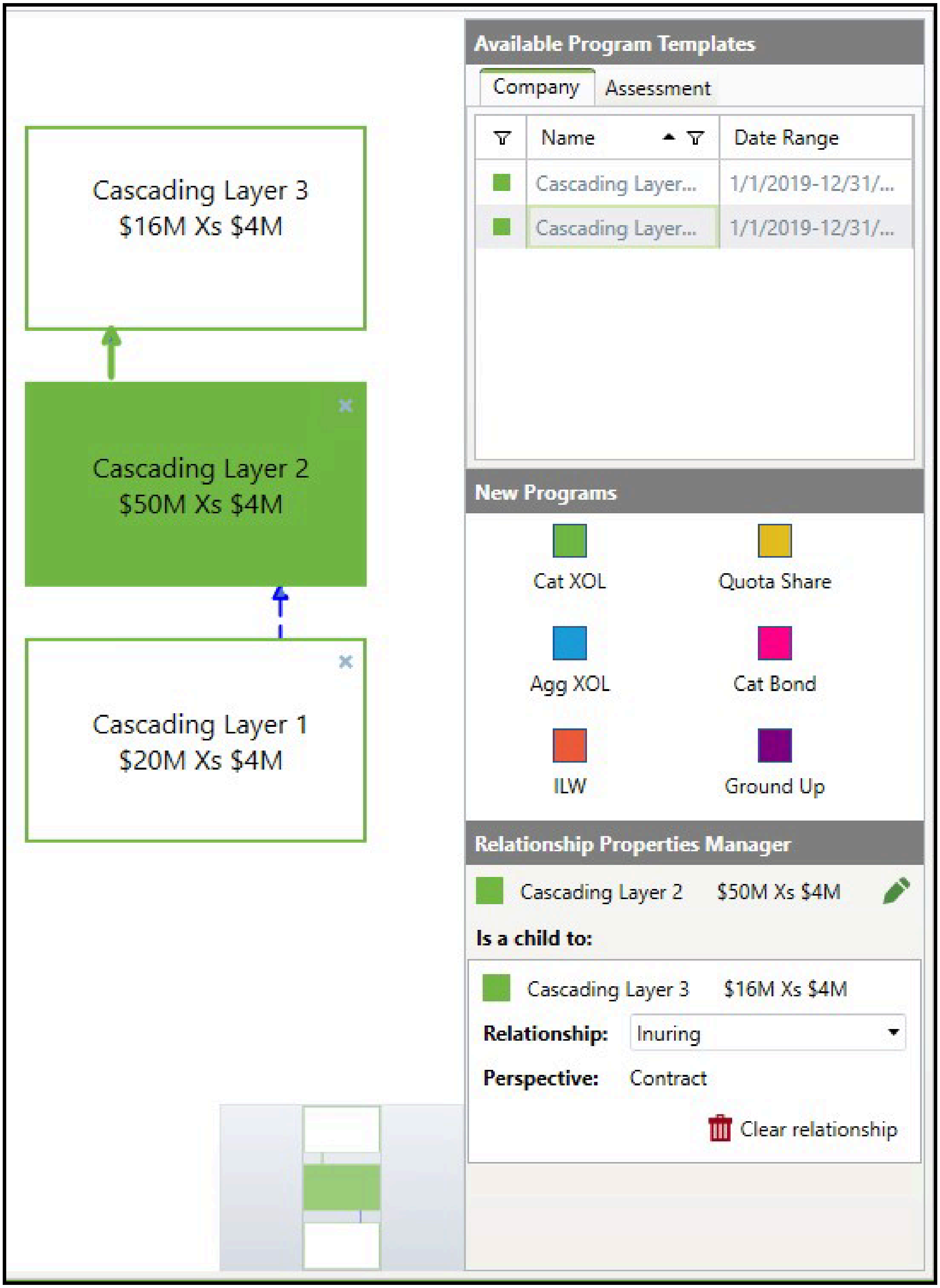


Figure 43. Dotted line indicates inuring losses

Per-event excess of loss programs with reverse franchise deductibles example

Use the program terms described in the previous topic to produce the contract losses for the company ground-up losses.

A sample event loss of $100 million has been used.

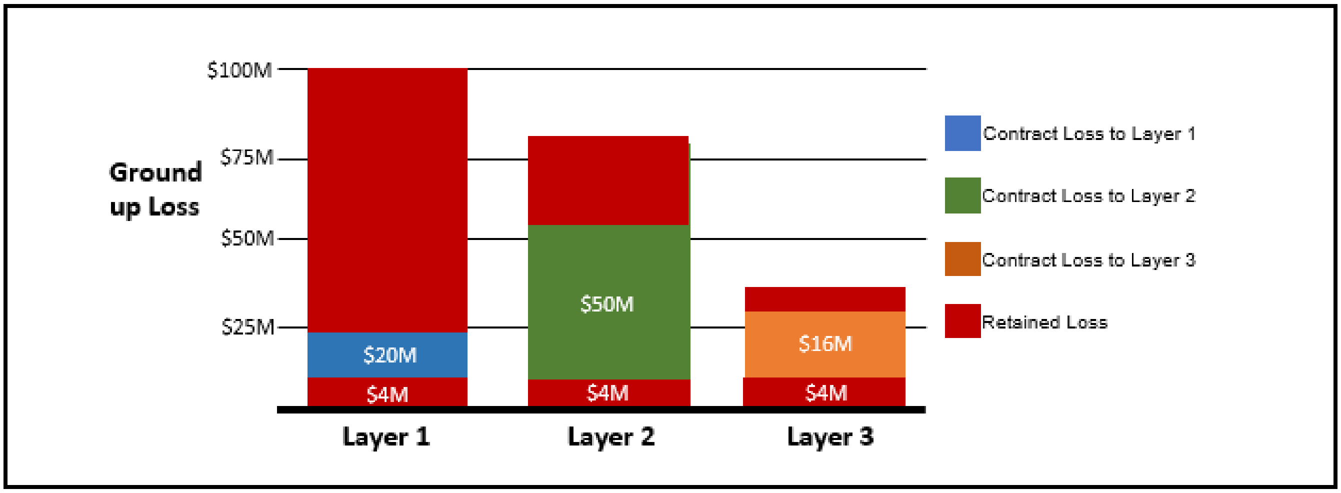


Figure 44. Ground up & contract loss for each layer in cascading structure

- *Layer 1: $20 million contract loss*

  The retention of the first layer is applied to the event of $100 million, reducing this loss to $96 million. This loss is limited to $20 million after applying layer 1 occurrence limit, therefore Layer 1 is eligible to $20 million contract loss.
- *Layer 2: $50 million contract loss*

  As the loss feeds into layer 2, the loss from layer 1 is removed before the terms of layer 2 are applied. The loss feeding into layer 2 is $100 million - $20 million which leaves a ground up loss of $80 million entering layer 2.

  After applying the occurrence retention of $4 million, this reduces the loss to $76 million. The limit of layer 2 is applied so that $50 million is eligible for contract loss for layer 2.
- *Layer 3: $16 million contract loss*

  As the loss feeds into layer 3, the loss from layer 2 and 1 is removed before the terms of layer 3 are applied. The loss feeding into layer 3 is $100 - $50 - $20 which leaves a ground up loss of $30 million entering layer 3.

  After applying the occurrence retention of $4 million, this reduces the loss to $26 million. This loss is limited to $16 million after applying the layer 3 occurrence limit. Layer 3 is eligible to $16 million contract loss.

13 Top-and-drop

In Touchstone Re a *Top-and-Drop* structure is a style of layering programs rather than an actual program type.

A top-and-drop provides the flexibility to reuse the top excess-of-loss layer in the reinsurance tower if the retention of this top layer is not breached by the first loss event. If the layer remains intact it acts as a reinstatement on one or more of the lower layers.

Depending on how the layer operates it can be modeled similarly to the structures described above.

Top-and-drop using step layers

If the top-and-drop layer is to be used as both a top cover and can subsequently reinstate as a lower layer after other layers have been exhausted, it can be modeled as a step layer. This means that the first layer must be exhausted before the layer drops down to provide cover at a lower retention.

Top-and-drop modeled as a cascading structure

The top-and-drop can alternatively be modeled in a similar way to the cascading structure. The lower CAT XOL layers inure to the benefit of the top-and-drop layer, meaning that the top-and-drop will attach either in the case of a single large event which exhausts the limit of the lower XOL layers, or in a subsequent event if the rest of the program is exhausted. The possible limitation in modeling the top-and-drop layer this way is that if the first event is large enough, the occurrence retention will be applied twice which may not be required. In this case use an additional program to remove the retention, with the net retained company loss then becoming the source for the Cat and top-and-drop programs.

Create a top-and-drop structure

Steps to create a program with a top-and-drop structure.

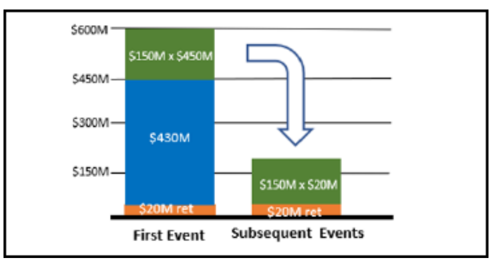


Figure 45. Sample program with top-and-drop layer structure

- Layer 1: 80M Xs 20M
- Layer 2: 100M Xs 100M
- Layer 3: 250M Xs 200M
- Top-and-Drop Layer: 150M Xs 450M or 150M Xs 20M (subsequent event)
- No reinstatements on any layers

Procedure:

1. First create a Catastrophe XOL layer for the cedant retained loss.
2. Navigate to **All Programs** tab.
3. From the **All Programs** tab, select **New**.

   The Add Program dialog opens.
4. Select **Catastrophe Excess of Loss**, name the program and then click **OK**.
5. Enter the following program terms on the **Layers** tab:
   - *Occurrence Limit*: $20M
   - *Reinstatements*: 99 (unlimited)
   - *Occurrence Retention*: $0M

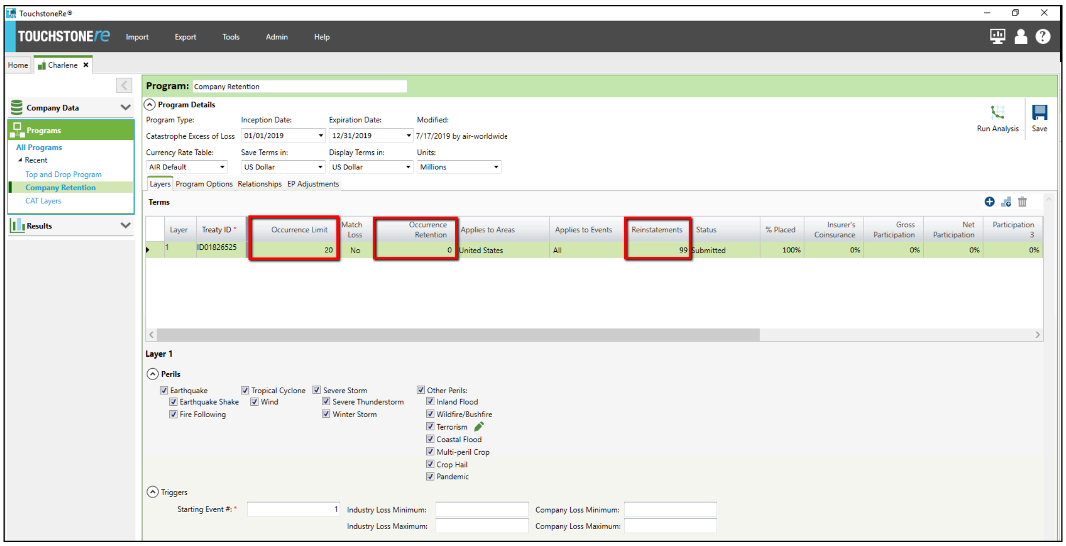


Figure 46. Top-and-drop program

6. Follow the same steps to create a new program for the **Catastrophe XOL** layers with occurrence limits and retentions as follows:
   - *Layer 1*: $80M Xs $0M
   - *Layer 2*: $100M Xs 80M
   - *Layer 3*: 250M Xs $180M

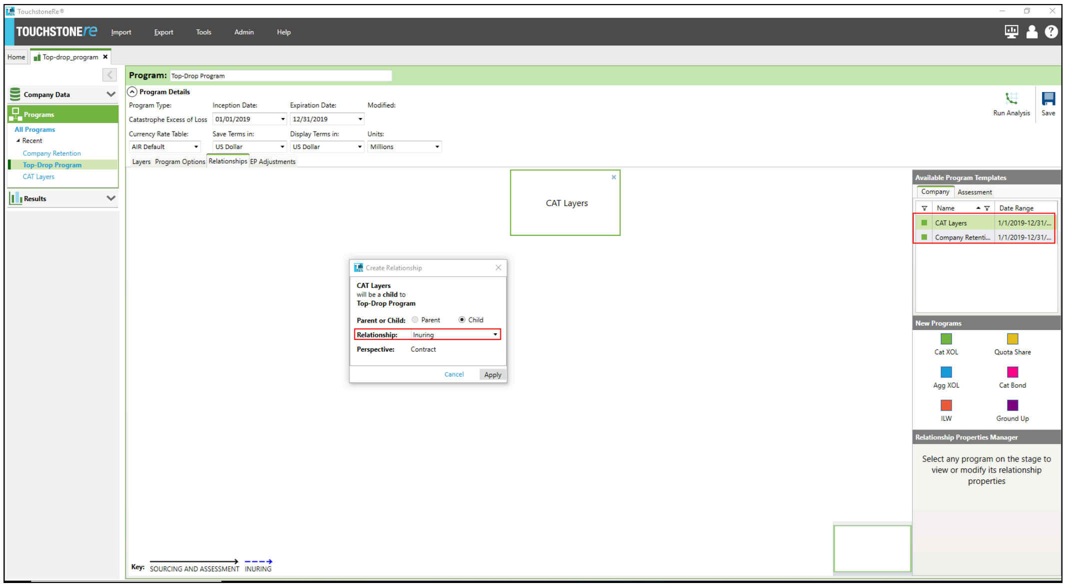


Figure 47. CAT layers program

7. Follow the steps above to create a new program for the Top-and-Drop Cat Layer with:
   - *Layer 1*: $150M xs $0
8. Click **Save**.
9. Select the **Relationships** tab to create the appropriate **Inuring** relationships.
10. Open the Top-and-Drop program and navigate to the **Relationships** tab.

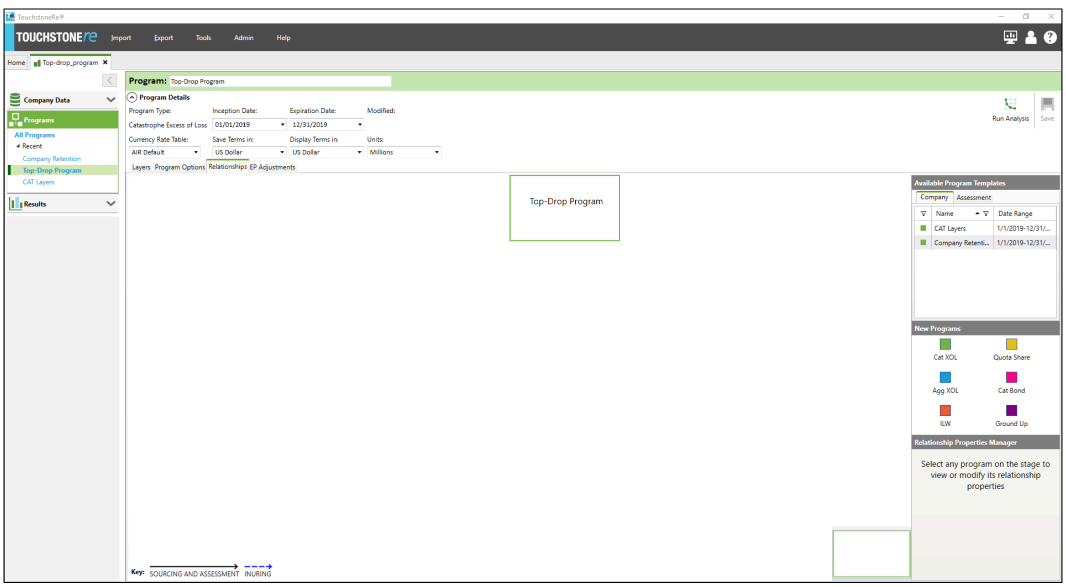


Figure 48. Parent program (top or drop layer) and layers to be sourced and/or inured

The Top-and-Drop layer is seen in the main window and to the right are the layers which can be related to this.

11. Drag the **Cat Layers** program from the right-hand window on top of the **Top-and-Drop**.

    The **Create Relationship** dialog box opens.

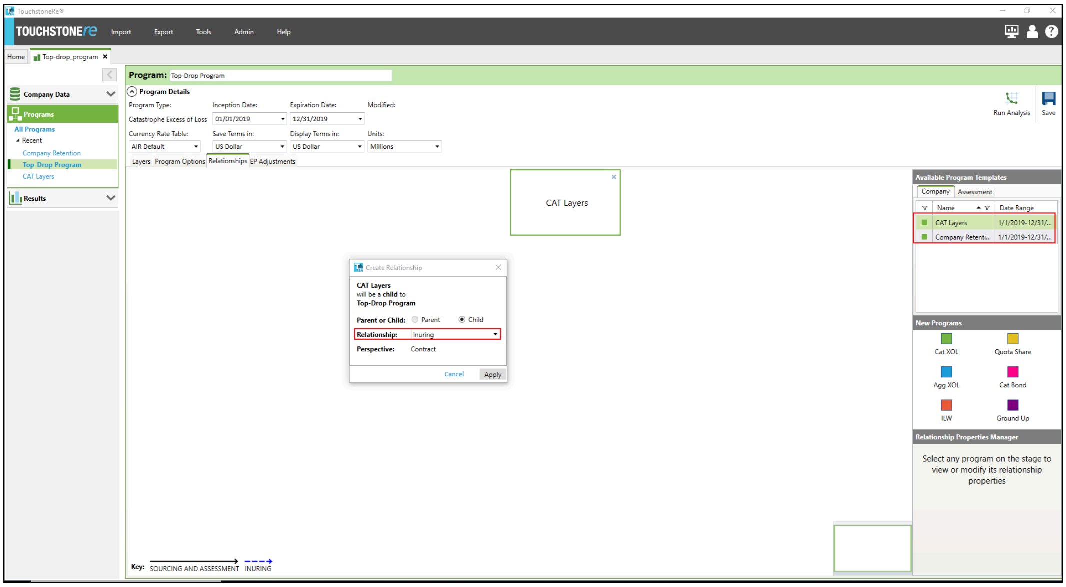


Figure 49. Drag-and-drop program on top of another in Relationships pane

This action invokes the Relationship pane

12. Select the relationship and click **Apply**.

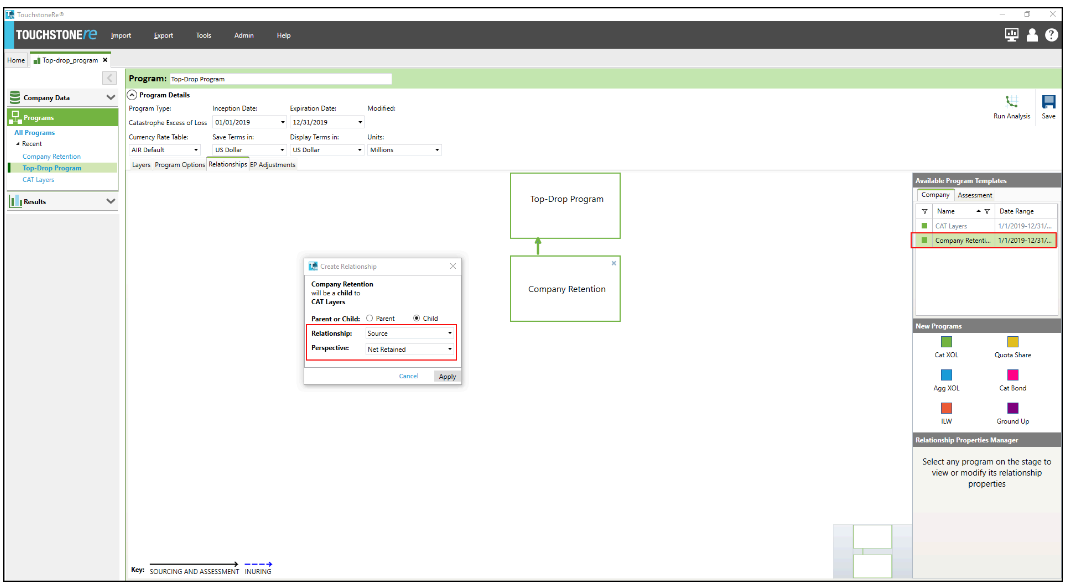


Figure 50. Source company retention layer: drag-and-drop over the catastrophe layers

13. Drag the **Company Retention** program from the right-hand window on top of the **Cat Layers** program and select the relationship.

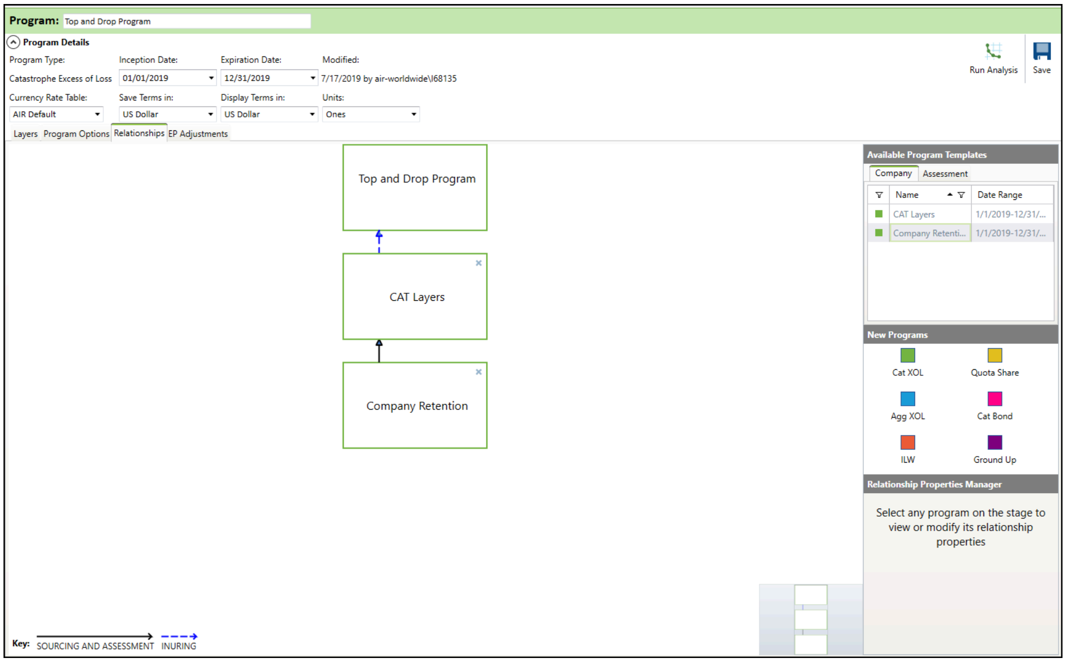


Figure 51. Three-tier structure

Company retention sourcing and Cat layers inuring to top-and-drop program

14. Click **Save**.

After setting up relationships, navigate to **Program Options** for the Company Retention program and then associate an Exposure Set.

Top-and-drop program loss example

Use the program terms described in the previous topic to produce the contract losses for the company ground-up losses.

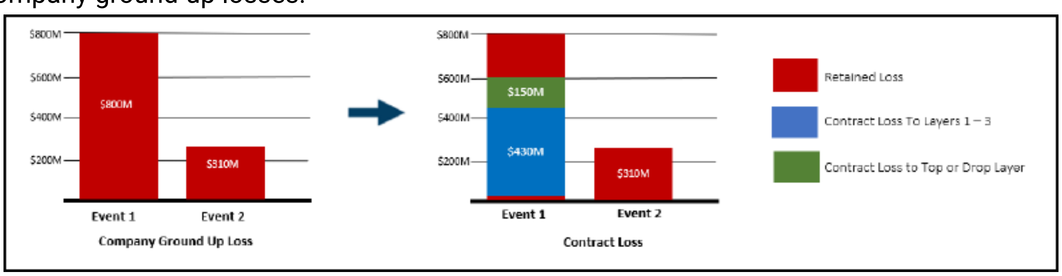


Figure 52. Event losses flow through program: 1st event reaches top layer limit

- *>Event 1>*: Contract Loss of $150m to top-and-drop layer

  The retention program removes $20m of the $800M event loss with the remaining event loss of $780m sourcing into the cat program. The first $430m of loss is absorbed by the CAT XOL layers. This is then also removed from the total loss that feeds into the top layer. The loss feeding into the Top and Drop is $350m which is capped at the layer limit of $150M.
- *>Event 2>*: No contract loss

The full CAT XOL program, including the top-and-drop has been exhausted.

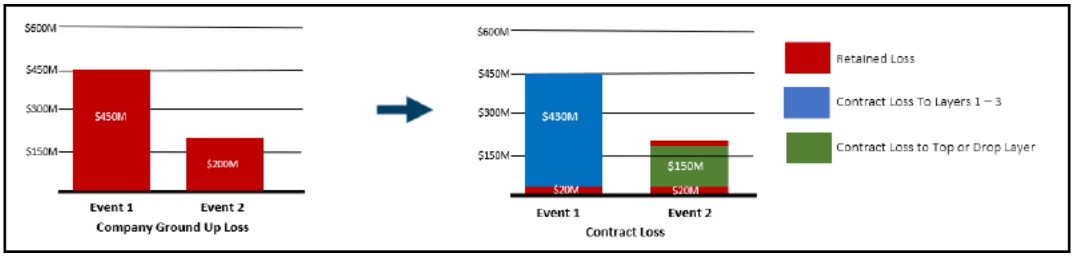


Figure 53. Event losses flow through program: 1st event does not reach top layer limit

Top Layer Drops Down for Second Event

- *>Event 1>*: No Contract Loss to top-and-drop layer

  $20m of loss is removed by the retention program, with the remaining $430 sourcing into the CAT XOL program which provides cover up to the limit. Inuring this to the benefit of the top-and-drop layer removes all remaining loss with nothing feeding into the top layer.
- *>Event 2>*: Contract Loss of $200m to top-and-drop layer

  The retention program removes $20m of loss and the remaining event loss sources into the catastrophe program. The lower CAT XOL layers have been exhausted but the top layer drops down.

  The top-and-drop program takes loss up to the limit of $150m. There is an additional £30m of loss retained by the cedant.

14 Nth-event covers

Nth-event cover contracts (N > 1) provide coverage above a per occurrence retention when a company is willing to absorb the loss above the retention up to some occurrence limit for the first N number of occurrence limits.

Second event covers, for example, would not pay for the first event producing loss that exceeds the occurrence retention. The Nth event may be defined as an event that exceeds the occurrence retention or as the event occurring when the full occurrence limit has been exhausted (similar to a contract with an amount otherwise recoverable where the amount is the occurrence limit multiplied by N).

Create Nth event covers

There are two different methods for creating Nth event covers in Touchstone Re.

- Method 1: using an Nth occurrence limit (otherwise recoverable)
- Method 2: using an Nth event exceeding occurrence retention

Second occurrence limit (otherwise recoverable)

Steps to create a second occurrence limit program.

Use a $250 million occurrence limit in excess of $150 million as a second event cover for this program.

Procedure:

1. From the **Company Data** pane, select the **Programs** tab and then click ⊕.
2. Select **Aggregate Excess of Loss** from the **Add Program Type** dialog box and then click **OK**.
3. Enter a unique name into the **Program Name** on the **Terms** tab.
4. Enter the following occurrence and aggregate terms:
   - *Occ Limit*: $250 million
   - *Occ Ret*: $150 million
   - *Agg Limit*: $250 million
   - *Agg Ret*: $250 million

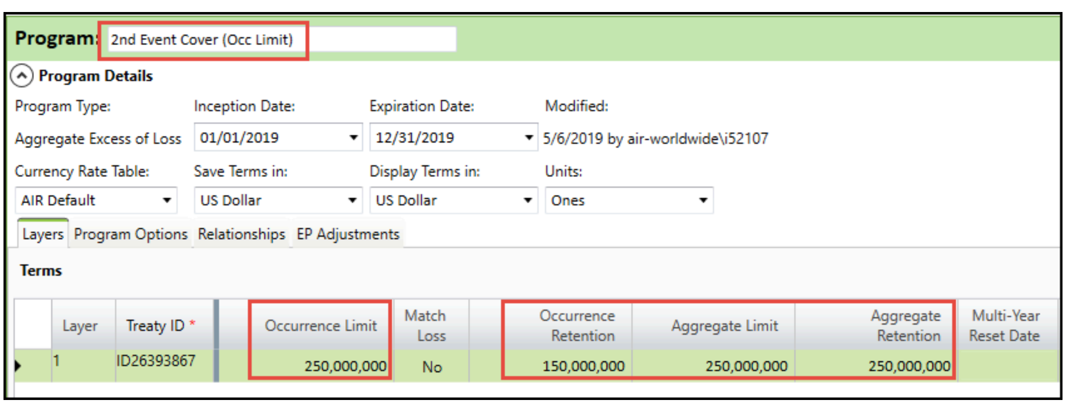


Figure 54. Nth occurrence limit (otherwise recoverable) program terms

Note

By setting the Agg Ret equal to the Occ Limit, you ensure the contract will never pay out on the first event because the Aggregate Retention will always be greater than or equal to the loss eligible to be paid out for the event. In cases where the Aggregate Retention is greater than the eligible occurrence pay out (i.e., if the event caused losses smaller than the occurrence limit), only a portion of the Aggregate Retention will be depleted. The remainder will carry over to the next event, causing some or all of the second event losses to be once again retained. The Aggregate Retention continues to carry over event-to-event until fully depleted

5. Click **Save** to store the newly created program.

Second event exceeding occurrence retention

Steps to create a second event exceeding occurrence retention program.

Use a $250 million occurrence limit in excess of $150 million with a second event cover for this program.

Procedure:

1. From the **Company Data** pane, select the **Programs** tab and then click ⊕.
2. Select **Catastrophe Excess of Loss** from the **Add Program Type** dialog box and then click **OK**.
3. Enter a unique name into the **Program Name** on the **Terms** tab.
4. Enter the following occurrence terms:
   - Occ Limit: $250 million
   - Occ Ret: $150 million

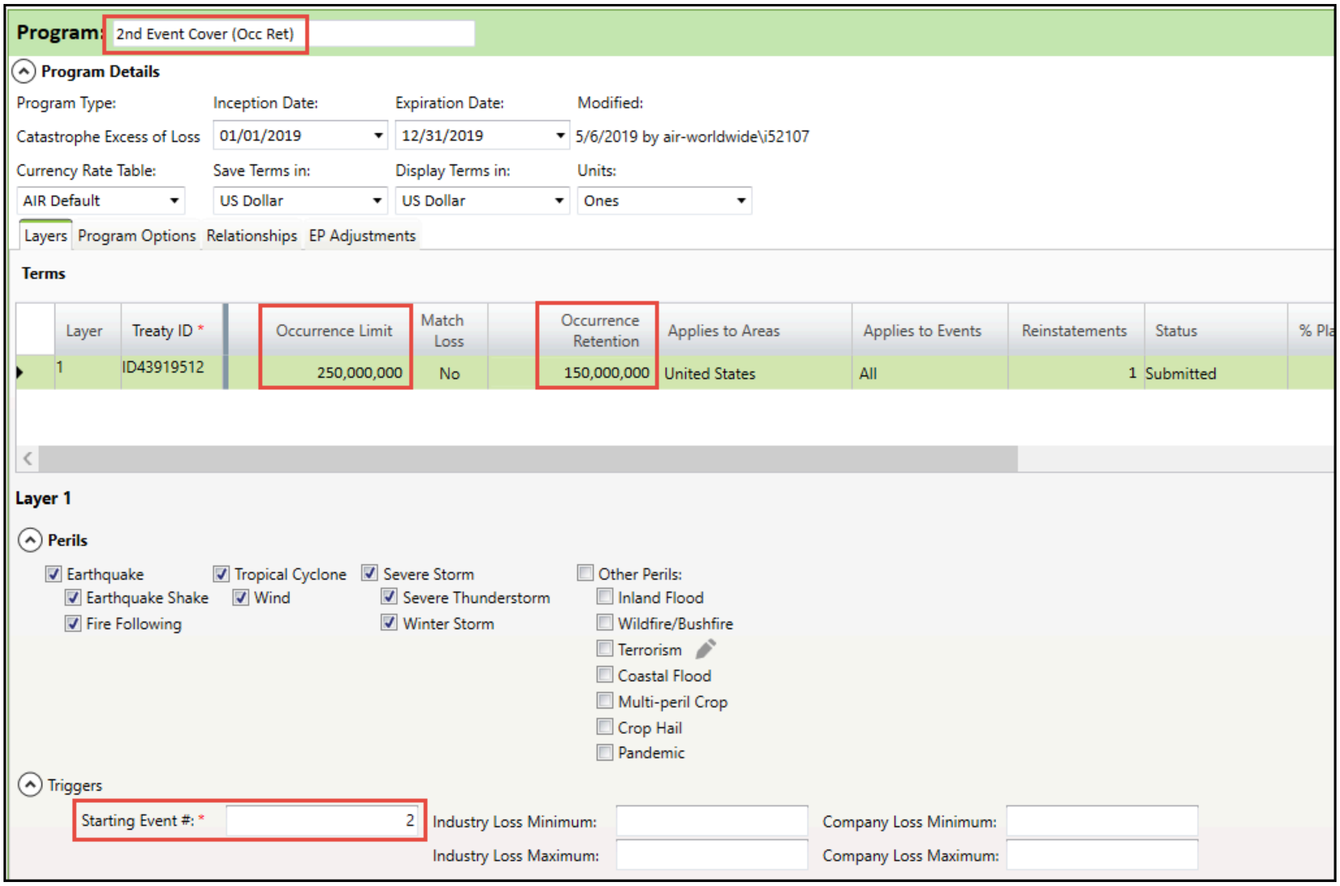


Figure 55. Nth event exceeding occurrence retention terms

5. Scroll down to the **Triggers** section and set the Starting Event # to 2.

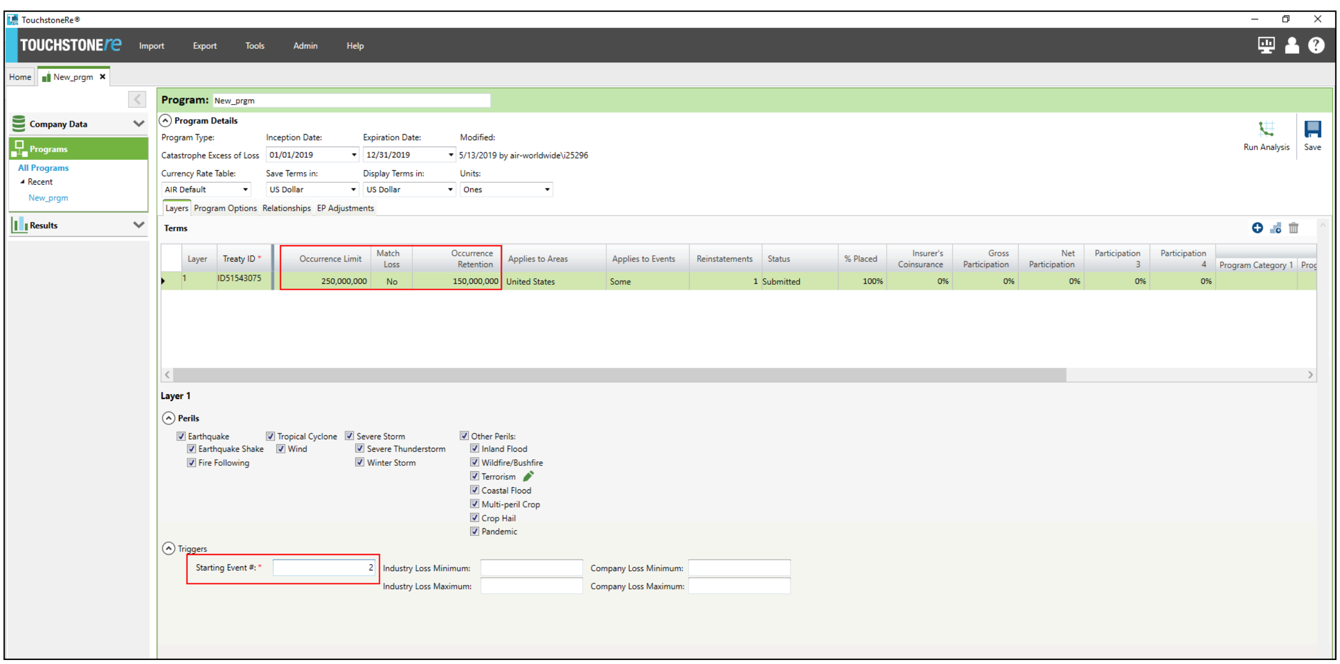


Figure 56. Starting event number

6. Click **Save** to store the newly created program.

Nth-event program loss example

Use the program terms described in the Second Occurrence Limit (otherwise recoverable) method in the previous topic to produce the contract losses for the company ground-up losses displayed below.

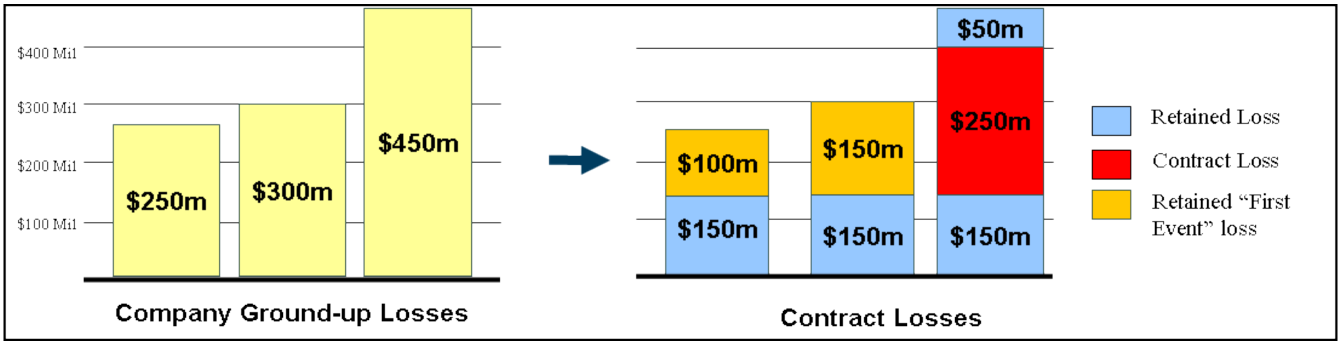


Figure 57. Second event cover (occurrence limit) contract losses

- *Event 1*: No contract loss

  The first $150 million is retained via the occurrence retention. The remaining $100 million is eligible contract loss; however, it is absorbed in its entirety by the aggregate retention term ($250 million), depleting the aggregate retention to $150 million.
- *Event 2*: No contract loss

  The first $150 million is retained via the occurrence retention. The remaining $150 million is eligible contract loss; however, it is absorbed in its entirety by the aggregate retention term ($250 million), completely depleting the aggregate retention
- *Event 3*: Contract loss of $250 M

  The first $150 million is retained via the occurrence retention. Of the remaining $300 million in loss, only the first $250 million is eligible contract loss. As the aggregate retention was exhausted on Event 2, the entire $250 million is paid as contract loss, capping the loss at $250 million for the year.

Using the program terms described in the Exceeding Occurrence Retention method in the previous section, Touchstone Re produces the contract losses for the company ground-up losses displayed below

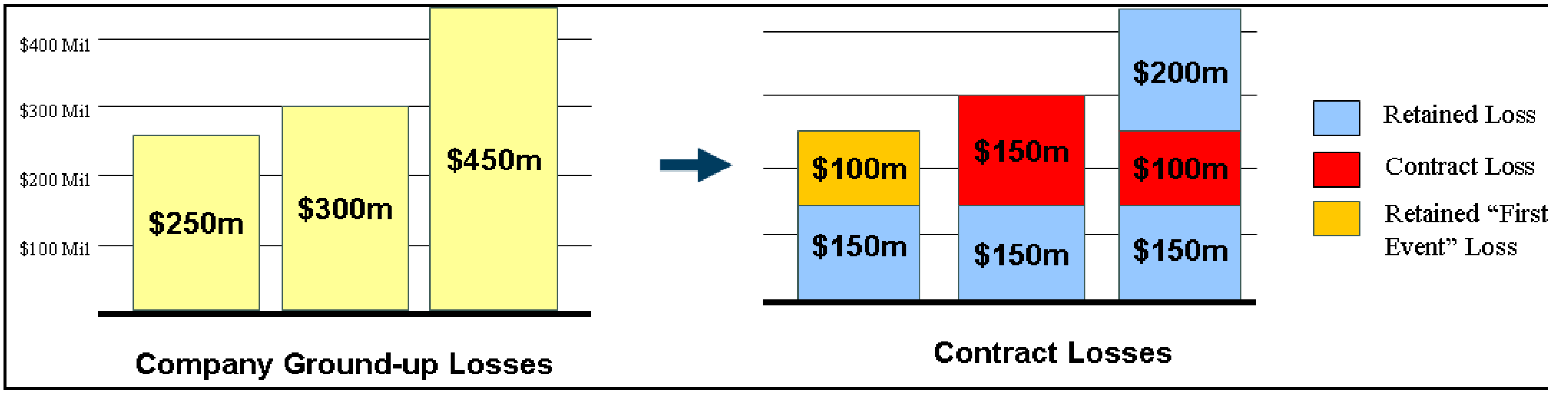


Figure 58. Second event cover (exceeding occurrence retention) contract losses

- *Event 1*: No contract loss

  The first event is excluded from consideration regardless of its size due to the starting event trigger.
- *Event 2*: Contract loss of $150 M

  The first $150 million is retained via the occurrence retention. The remaining $150 million is eligible contract loss. Since there are no aggregate terms, the entire $150 million is paid as contract loss.
- *Event 3*: Contract loss of $100 M

  The first $150 million is retained via the occurrence retention. Of the remaining $300 million, $250 million is eligible as contract loss, however, only the first $100 million is paid because there is no reinstatement on the occurrence limit for that event and losses are capped at $250 million for the year.

About Verisk

Verisk Analytics (Verisk) provides risk modeling solutions that make individuals, businesses, and society more resilient to extreme events. In 1987, a Verisk subsidiary founded the catastrophe modeling industry and today models the risk from natural catastrophes, terrorism, pandemics, casualty catastrophes, and cyber incidents. Insurance, reinsurance, financial, corporate, and government clients rely on Verisk's advanced science, software, and consulting services for catastrophe risk management, insurance-linked securities, longevity modeling, site-specific engineering analyses, and agricultural risk management. Verisk (Nasdaq:VRSK) is headquartered in Jersey City, New Jersey with many offices throughout the United States and around the world. For information on our office locations, visit https://www.verisk.com/about/locations/.

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