WIND LOAD, SURFACE

1- Question : January 7, 2008

I have a question about the wind load. In a model, I added some load surfaces and an auto *wind load*. But when I change the magnitude or direction of the *wind load*, the result (the internal stress of any pieces) doesn't change. Do I need to calculate the pressure on those load surfaces? Except these surfaces, the other structure also have wind load, how can I implement this?

Answer

From version 6.5, wind loads can be applied directly to surface.

In versions of SAFI prior to 6.5 the automated wind load applies only on members. In order to apply wind load on surfaces, you must first compute the pressure, then apply manually the pressure load on this surface.

Please note that in your model, you used the "Automated Wind Load (Tower)" which is not the good way for adding wind to a general structure, it is valid only for tower generated from the tower module. You should activate the *wind load* from the member loads. Please refer to the pages 9 to 11 of the pdf file "What's new in Version 6.3" from your computer or installation CDROM.

From the analysis part of the "Results bar", you can look at the "Reaction summary" table which will help you verifying the total factored external load apply on the structure for each load combination.

CHARGE DE GLACE

2- Question : 12 septembre 2008

Je dois faire la conception d'un château d'eau en acier et je dois ajouter une charge due à la glace. Serait-il possible de me confirmer comment ajouter une charge de glace sur les membrures en acier de ma structure. Je crois qu'il est possible de le faire à partir de des charges générales dans *poids propre* mais je ne suis pas certain.

Réponse

Les charges de vents sur les structures en treillis peuvent être automatisées. Cependant, les charges de glaces ne peuvent être ajoutées directement aux membrures. L'option la plus simple semble être de calculer la charge de glace comme une charge uniforme en "kN/m" et de l'appliquer aux membrures. La valeur sera cependant différente en fonction de la forme et la taille du profilé.

CHARGE RÉPARTIE VARIABLE, PLAQUE

3- Question : 22 janvier 2009

Est-ce qu'il est possible de mettre une charge répartie variable sur une plaque?

Réponse

Présentement, les plaques supportent des charges concentrées et des charges de pressions uniformes. Pour créer des charges de pression hydrostatiques, il faut créer des charges de pression uniformes sur chaque plaque ou la pression peut être déterminée selon l'élévation du centre de la plaque. Il n'y a pas d'outils dans la version courante de SAFI pour créer ces charges, l'utilisation d'Excel en copiant les tables de joints et de plaques de SAFI pourrait aider.

DIFFERENT LOAD CASES

4- Question : January 29, 2009

I am wondering how to input different load cases (as opposed to load combinations). For example: case1 wind - from North, case 2 - wind from East, all other loads the same. I have been changing the wind/snow loads and then running each case separately, but it seems to me that you should be able to do it all in one run.

Answer

In fact you can run a model with up to 100 basic loads (independent) and you can use as many combined loads as you wish. Each combined load can be composed of several basic loads. The best is to refer to a file like *FRAME2D.str* in our sample problems. Look at the load combinations that refer to *BASIC* loads. A basic load can be a joint load, concentrated or uniform load…

DIFFERENT FACTOR, SELF WEIGHT

5- Question : February 9, 2009

Is there some way to apply different factors to the self weight in one model? For example can I have a self weight X 1.25 on the mast and then a self weight X 1.7 on the carrier (Truck) portion of the same model?

Answer

There is no way to apply the self weight with different factors to different part of the structure. Maybe you could change the "Voluminal mass" of the member's cross section material on which this amplified factor apply.

WIND PROFILE DATA, ELEVATION

6- Question : June 11, 2009

1. Is there a way in SAFI to input a pressure / velocity coefficient at different elevations above the derrick's base?
2. I am trying to analyze a derrick with SAFI and I am not sure how to input the 3 second gust wind (Vdes) that will vary at the different elevations of the derrick.
3. In SAFI, the wind profile input data only asks for wind speed and the gust factor. How do you input data so the wind will vary as you go up the derrick?

Answer

1. In SAFI you can input a *User defined wind pressure profiles*. This profile let you specify the "Pressure" according to a given elevation. The elevation 0 corresponds to the "Y coordinate of the Ground" level specified in the Wind profile.

2. When you select in SAFI the "API 4F-2008" pressure distribution method, the "Wind speed" input data corresponds to the "Vdes" of the API 4F third 3d.

You can calculate $V_{des} = V_{ref} \times a_{onshore}$ (cl 8.3.1.1) or $V_{des} = V_{ref} \times a_{offshore}$ (cl 8.3.1.2) where V_{ref} is defined as the "3-Second gust wind".

3. When you select in SAFI the "API 4F-2008" or "API 4F-1995" pressure distribution the variation of pressure according to the height is calculated automatically by SAFI.

DISPLAY COMBINATION LOADS

7- Question : June 28, 2009

We have some problems in designing a new structure with SAFI 6.4.3. A suggestion to SAFI, it may be better to add a function to display *Combination Loads* in *display options*.

Answer

There is a command called "Calculate load c.g." which can help you get the "total load for each load combination or basic load". This is not exactly what you are asking for, but it is useful to verify input.

LOAD COMBINATION BOX, DELETE

8- Question : June 30, 2009

When working in the load combination box I inadvertently typed in the wrong thing, but I cannot delete it out, how do you delete things out of this box?

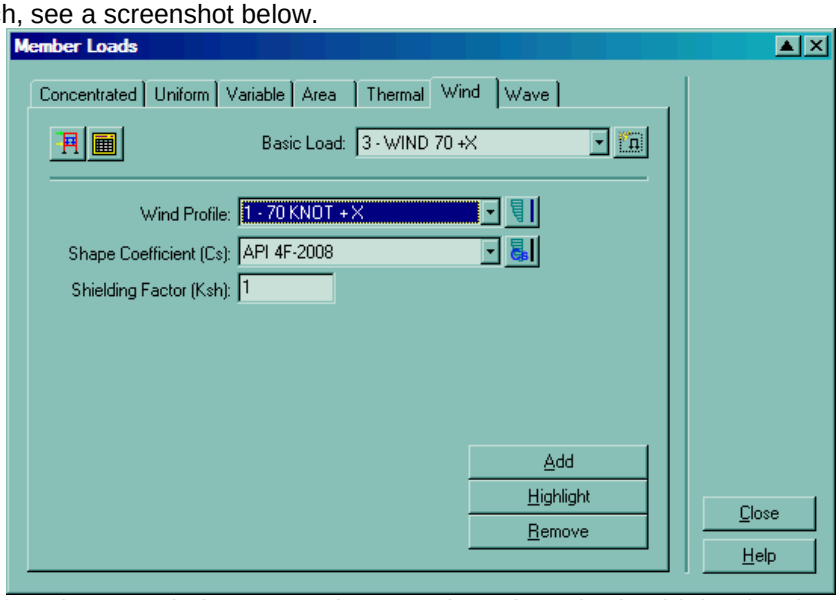
Answer

In the load combination you can generally modify any input by clicking on the value or by double-clicking on the name of the tab. But you cannot change the name of the basic loads which are defined from the Basic load command. You can set any of the factors to 0.0 to deactivate a load for a given load combination, but you cannot erase a basic load from there unless a basic load is completely unused. To erase a combination you have to click on the "X" button at the top right of the dialog box.

DIRECTION, WIND FORCE, INCLINED

9- Question : June 19, 2009

It seems to me that there is no choice for ways of determining the direction of the resultant wind force on a member subject to an inclined wind, i.e. Projected Area Approach, Projected Pressure Approach, and Velocity Component Approach, see a screenshot below.



Unless a loading surface is created, the approach cannot be selected. Should the developer make a change on that? Please kindly comment on it.

Answer

For surfaces, we ask for the required Approach. For members, we always apply the same approach as described below.

for API 4F-2008 wind profile--> Velocity Component Approach
for all others wind profiles (including API 4F-1995) --> Projected Pressure Approach

We recently found that this input should be added for the "User defined wind profile" and some particular cases. So please consider that this input field will be available very soon for the final version for SAFI 6.5.

LOAD COMBINATION BOX, DELETE

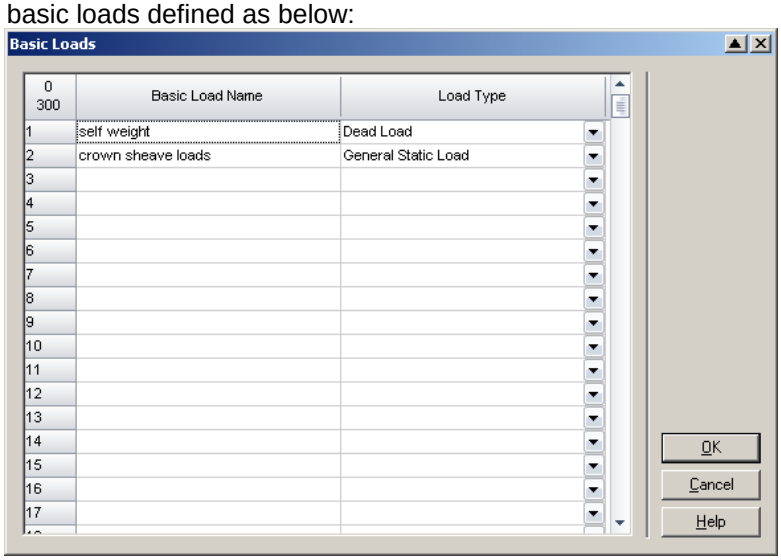
10- Question : July 17, 2009

I am having trouble with the load combination box.
I have a derrick model that started out as a normal derrick. Then I added pins to the four legs so I could rotate the top one fourth of the structure so the structure would go under a bridge. When in its first normal version I had crown block loads from hoisting and ran an analysis on it; so I had two load cases; one was dead weight and the other crown block loads from the wire line.

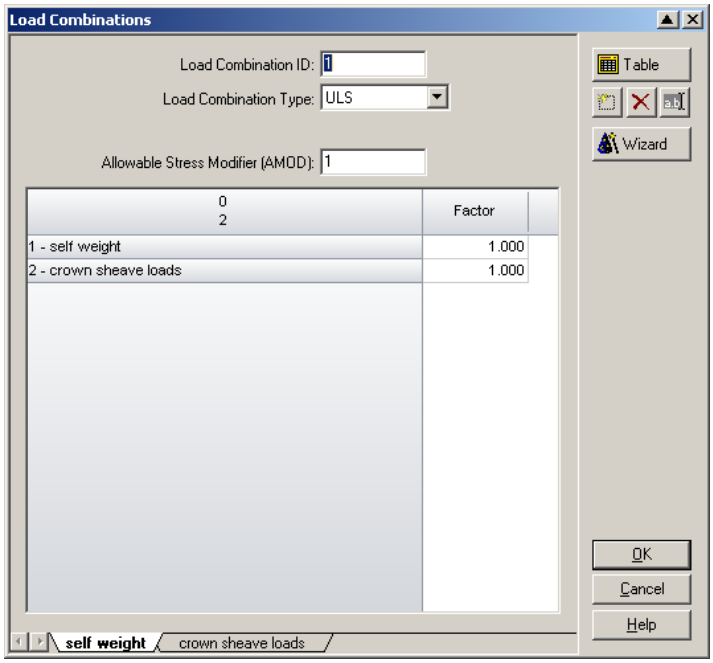
Then I used save as and created a second model. On the second model I rotated the top over 108 degrees and deleted the crown block loads from the joint loads table. Then I tried to run the analysis and I get a note “load data cannot be found or file is empty”. I still had the crown loads listed in the load combinations. I deleted the 1.0 for the load factor but I still cannot run the analysis and I cannot delete the text out of the other space to the left of the factor box.

Answer

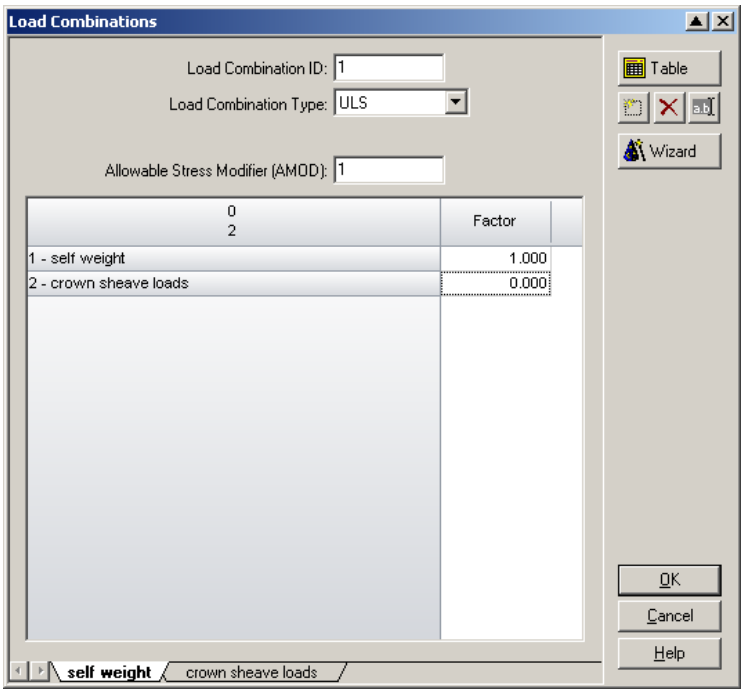
Let say that you have 2 basic loads defined as below:



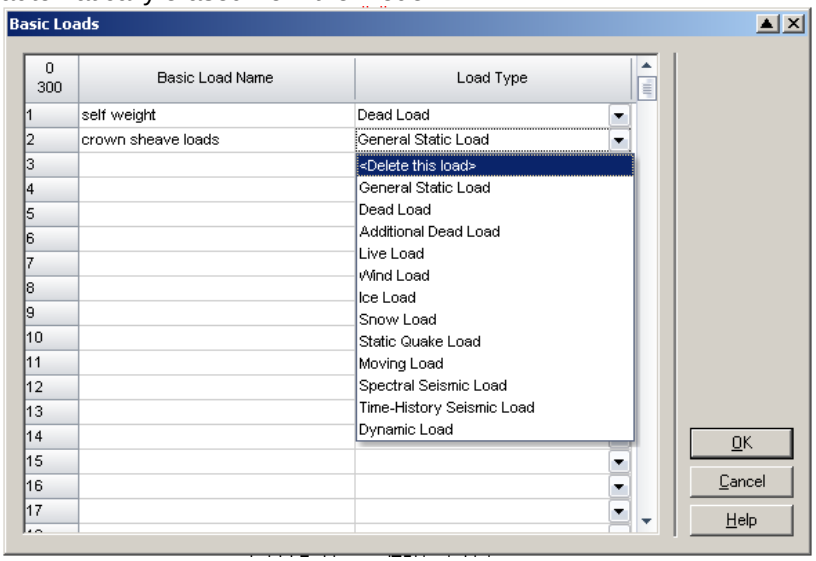
When you will look at the *Load combinations*, you will always see the 2 lines corresponding to the 2 defined basic loads as below:



In the example above, the “Self weight” combination include the 2 basic loads with a factor 1.0. For example, to deactivate the “crown sheave loads” form this load combination, you will need to force 0.0 in the corresponding line. See the result, below:



If a load is no longer required for any load combinations then you may delete this basic load. To do so, you need to go back to the basic load table and select “Delete this load” from the *Load Type* list. The result of this operation will be that the basic load will be erased automatically from all the load combinations. Also, all loads for this basic load will be automatically erased from the model.



If you get an error “load data cannot be found of file is empty” it means that there is absolutely no load defined for a given load combination. This is not accepted by the program, if a load combination exists, it must contain at least one load. In your case, you erased some loads from the model which invalidated a load combination. In this situation, you must delete the invalid load combination.

You can erase a load combination by clicking on the button  from the *load combination*. Or if you click on the button  you have access to the table of the load combinations in which each row corresponds to a combination that you can erase by selecting the line and then press on the “Del” key from the keyboard.

CHARGES NEIGE, ASYMÉTRIQUE, ALTERNÉE

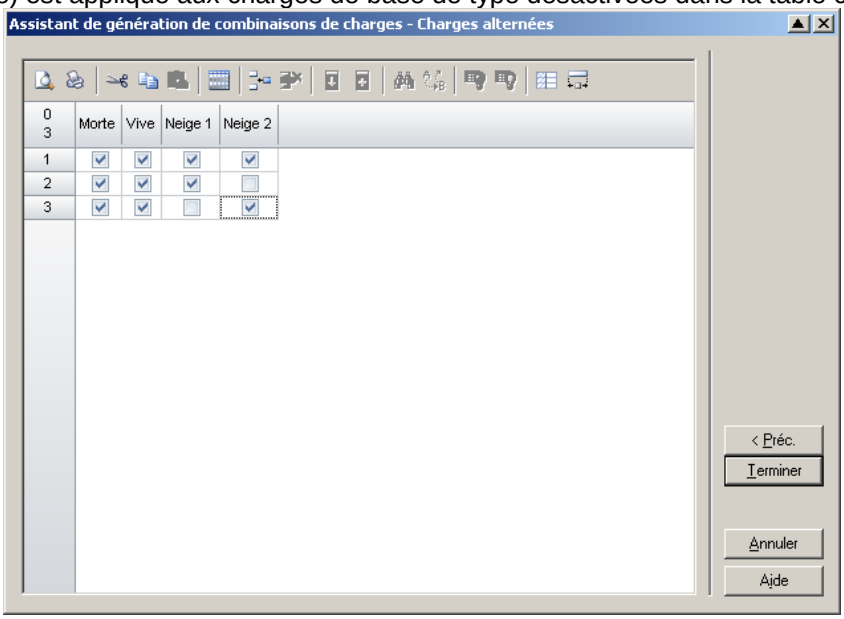
11- Question : 24 août 2009

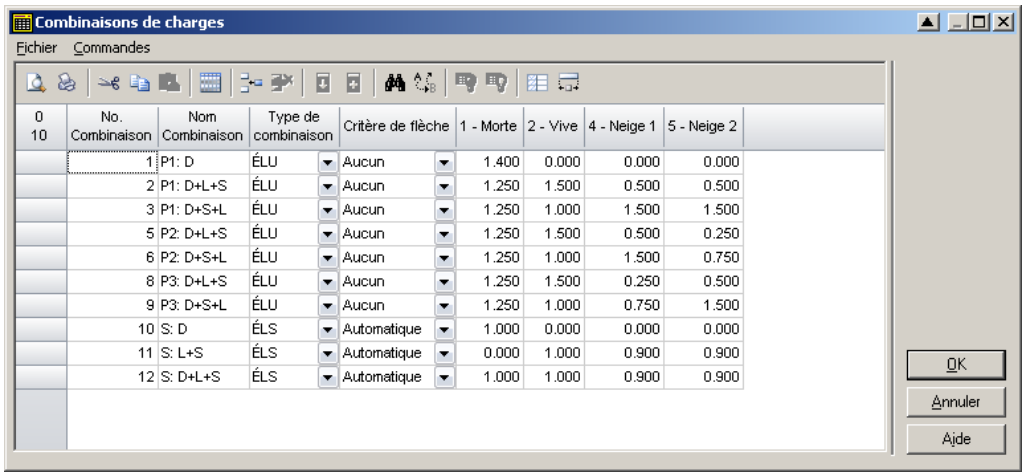
Pour créer des charges de neige asymétriques sur un toit à 2 versants tel que spécifié à l'article 4.1.6.3 du CNB05, je conçois premièrement avec des charges de neige totales sur le toit complet. J'enregistre ensuite sur un autre nom et enlève la moitié de la charge d'un côté pour vérifier les effets. Il y a une option de charges alternées lors de la création des combinaisons de charge dans SAFI. Je me demandais comment cette option fonctionnait et si elle servait aux fins de l'article ci-haut mentionné.

Réponse

Il y a une option de charge alternée dans le générateur de combinaisons de charges dans SAFI. Par contre, vous pouvez aussi effectuer cette opération manuellement dans un même fichier. Tout ce que vous devez faire c'est de créer 2 charges de base (ou plus) pour la neige et d'activer dans les combinaisons de charges la première, la deuxième ou les deux avec les facteurs de combinaisons de charges appropriés. Ceci créera plus de combinaisons de charge qu'habituellement.

Si vous utilisez l'assistant vous devrez faire remplir la boîte de l'assistant d'une manière similaire à la suivante. Notez que le champ d'entrée nommé "Ratio des charges minimales" de 0.5 (définie à l'étape précédente du générateur de charge) est appliqué aux charges de base de type désactivées dans la table ci-dessous.





Vous vous retrouvez donc avec 3 patrons de chargement P1, P2 et P3