MEMO

		FOR YOUR ATTENTION	COMMENTS ARE INVITED	FOR YOUR INFORMATION	AS AGREED
MEMO CONCERNS **Release Notes** **USFOS Version 7-8**					
DISTRIBUTION Members of USFOS user group				x	

www.sintef.no

Address:
SINTEF group, MARINTEK,
Structural Engineering
Box 4125, Valentinlyst
7450 Trondheim
Norway

Location: Otto Nielsens vei 10

Tel :+47 7359 5611
Fax :+47 7359 2660

FILE CODE	CLASSIFICATION Open
ELECTRONIC FILE CODE	

PROJECT NO. 700030	DATE 2001-06-10	PERSON RESPONSIBLE/AUTHOR Tore Holmås	NUMBER OF PAGES 8

Release notes
USFOS 7-8, June 2001

Contents:

1. Introduction

The current version of USFOS (version 7-8, 2001-06-10) is the final version of the 1999-2000 user group development period. The current release with date 2001-06-10 contains following:

❑ CD-ROM
❑ Release Notes (this MEMO)

Except for this MEMO, no "paper information" will distributed in connection with this release. All information is stored on the CD.
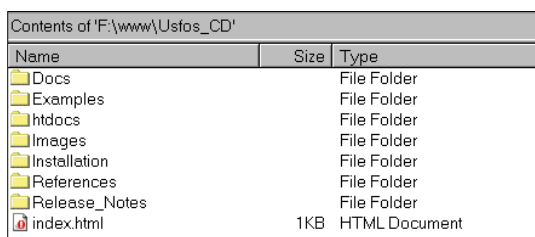
2. Contents of CD-ROM

2.1. Introduction

All USFOS information will gradually be transferred to HTML documents, which are read by standard WEB browsers (Netscape, Opera, Internet Explorer etc). Creation of the HTML documents is just started, and the current CD is thus containing only a limited part of the planned information.

2.2. Overview

The contents of the current CD-ROM are easiest found using either a file browser (NT-explorer) or a WEB browser. However, some information about the contents will be given in this MEMO.

Figure 2.2-1 describes the files/folders on the top level of the CD-ROM.

Figure 2.2-1 Contents of Usfos 7-8 CD-ROM

The "*Docs*" folder contains general information, all describe in PDF format (the free Acrobat Reader could be used). The documents are (see Figure 2.2-2) the usual manual pages (Chapter 6), an introduction to USFOS for new users (Getting_Started.pdf), and some documents describing specific topics (referred to below in this MEMO).

Figure 2.2-2 Contents of "Docs" folder

The HTML document contains two main branches (see Figure 2.2-3):

❑ Installation
❑ Examples

Figure 2.2-3 Main Page of USFOS 7-8 HTML document

The installation main page is shown in Figure 2.2-4, where references to Windows and Linux are given.
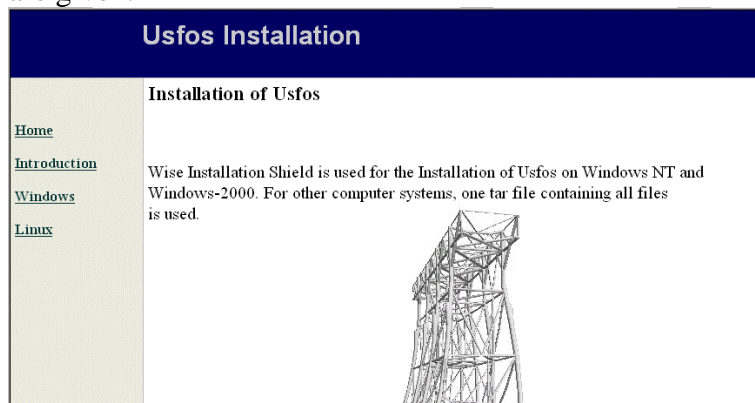
Figure 2.2-4 Installation Main Page

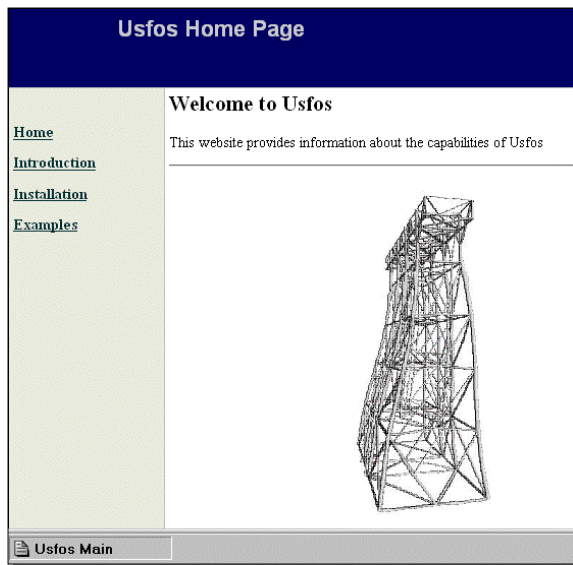The examples HTML document contains basic examples used to describe some basic features as well as "real" examples, (see Figure 2.2-5). This HTML document is currently under construction, and only a limited part pf the planned document is available:.

❑ Basic Elements
❑ Basic Loads

All basic elements of USFOS, (see Figure 2.2-6), are described in terms of examples and properties. For more information, use the WEB browser.

Figure 2.2-5 Examples Main Page

Figure 2.2-6 Basic Elements Main Page

The "old" example collection (located in the $USFOS_HOME/examples folder) is extended describing the new features. This example collection will be replaced completely by the new, HTML based collection in next release.

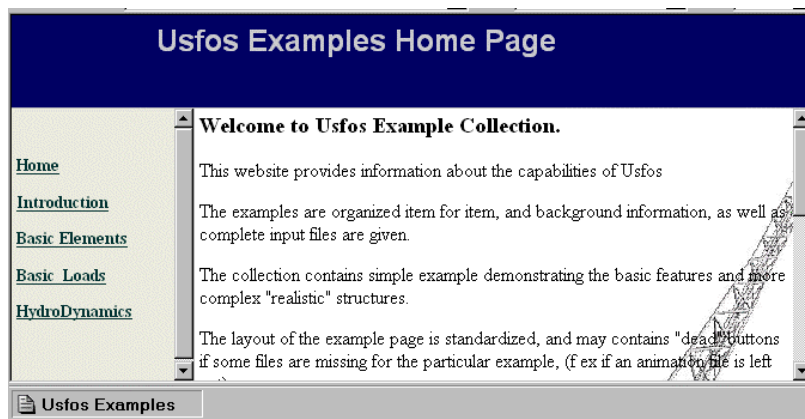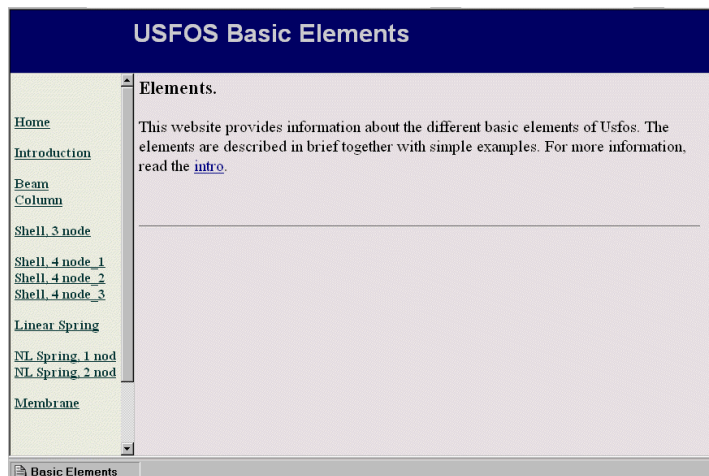## 3. News in USFOS version 7-8.

3.1. 4 Node Nonlinear Shell

A 4 node non linear shell element (Haugen-Skallerud) is implemented in USFOS 7-8. The element is based on same technology as the existing triangular shell element. For more information, see the CD-ROM, *Examples/Basic Elements/Shell.*

Usfos Shell Verification. Buckling of Alum Girder.

LoadComb: 1 Level : 240.440

Figure 3.1-1 4 node Non linear Shell Element.
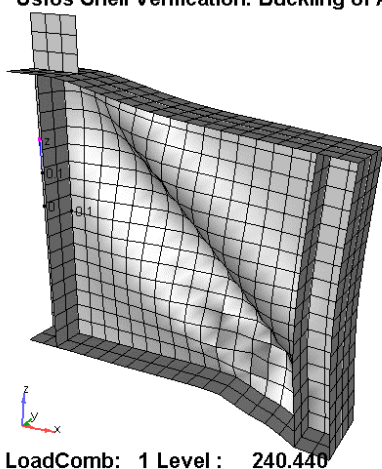
3.2. Local load on Substructure Shell elements

The Substructure Shell feature for beam elements is extended with the possibility of applying local loads on the (automatically generated) shell surface. Examples are described in the 'old' examples collection (ssh_loa01 – ssh_loa03).
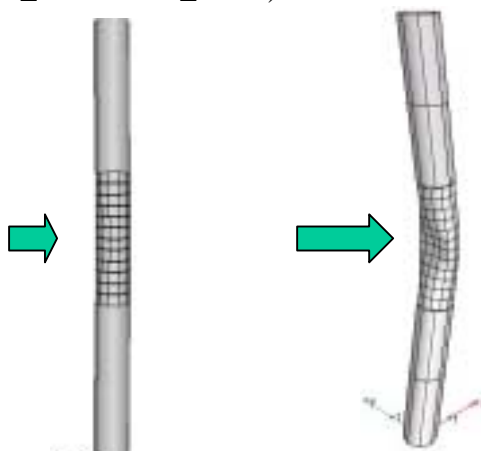
Figure 3.2-1 Local impact on Shell Beam Element (Substructure Shell technology)

3.3. Extended Spud Can capabilities

The spud can foundation model is extended to handle clay (in addition to sand), according to SNAME. The (old) MSPUD record is replaced by the new SPUDMAT input record, which is used for both sand and clay (SpudMat <Mat_ID> **clay** or SpudMat <Mat_ID> **sand** ...). The old MSPUD record will still be read by USFOS , but will be removed in a future release.

For more information about the background and use of the Spud Can model, see the course manual "Getting_Started", section "Foundation".

Spud can is Sliding (Gap opens)

Highest utilization on compression Side

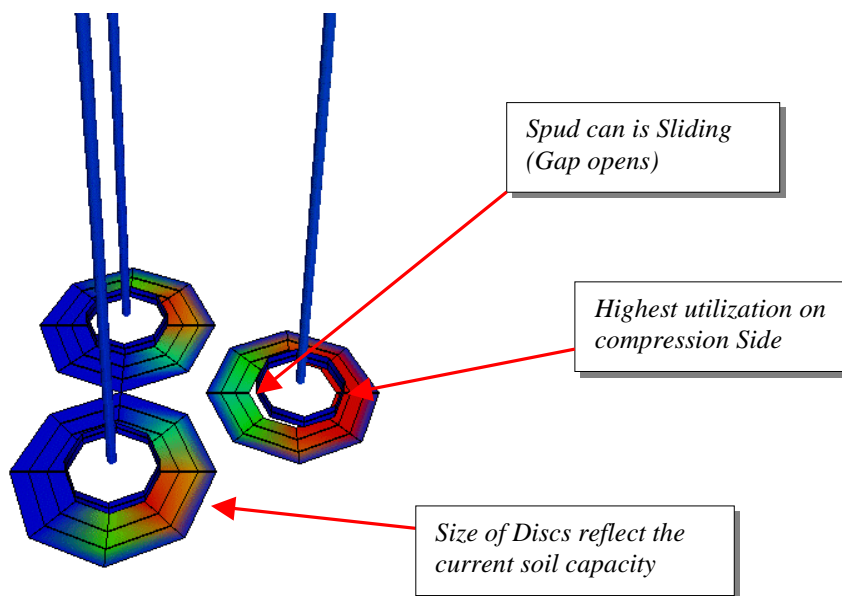*Size of Discs reflect the current soil capacity*

Figure 3.3-1 Visualization of SpudCan in XFOS

In XFOS, the spudcan element is visualized as shown in Figure 3.3-1. The effective spudcan diameter is used to define the short "pipe stub", (which also is the inner diameter of the soil disc). The soil disc diameter reflects the current capacity, (which is highly dependent on the vertical load on the spud can), will thus increase/decrease during the analysis as the vertical load changes, see Figure 3.3-1.

Soil utilization is visualized (plastic utilization), showing the localization of soil compression. Sliding of the spud can is easily seen as the gap between the soil disc and the spud can.

3.4. Calculation of Strain

Calculation of strain (beam elements) based on plastic displacement and rotations is improved in the 7-8 release. For the existing features, this will influence on the USERFRAC option only (other estimation of strain may give fracture at a different load level compared with previous USFOS versions).

In addition, the new XFOS version (version 2.9), an extra result type in the results menu, (Strain, see Figure 3.4-2), for visualization of the current (plastic) strain level in the structural members.

Figure 3.4-1 Xfos 2.9 is released together with USFOS 7-8.

The visualized strain is the highest tensile strain at the actual beam section (End1, End2 and midnode) and *does not* describe *strain gradients* over the cross section.

Comparisons with alternative calculation methods (USFOS shell, ABAQUS shell, NORSOK) are presented in the "Tensile_Fracture.pdf" document located in the "Docs" folder on the top level of the CD-ROM.
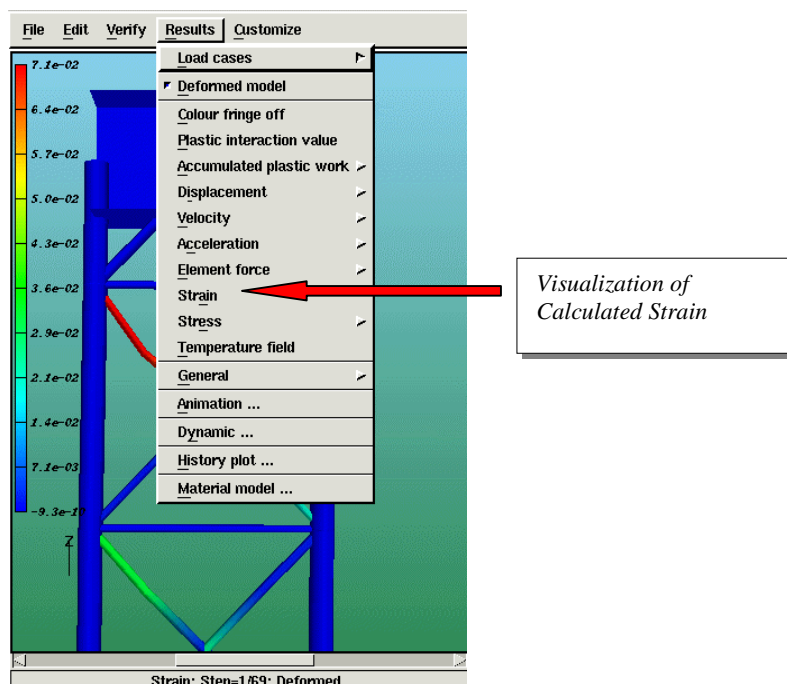

Figure 3.4-2 Visualization of Tensile Strain in Xfos

3.5. Visualization of Groups

In order to ease the user input, groups are used (ref release notes for USFOS 7-7). In XFOS, it is possible to include/exclude groups from the image (Edit/Clip/Group).

For example if you want to visualize one or a few groups only:

- ❏ Remove all   (whole model disappears)
- ❏ Include Group(s)   (select the actual group(s) and insert)

Selecting "show all", the whole model visualized. Similar, if some groups should be removed (f ex soil discs in order to see the pile better), select actual group(s) and "exclude".
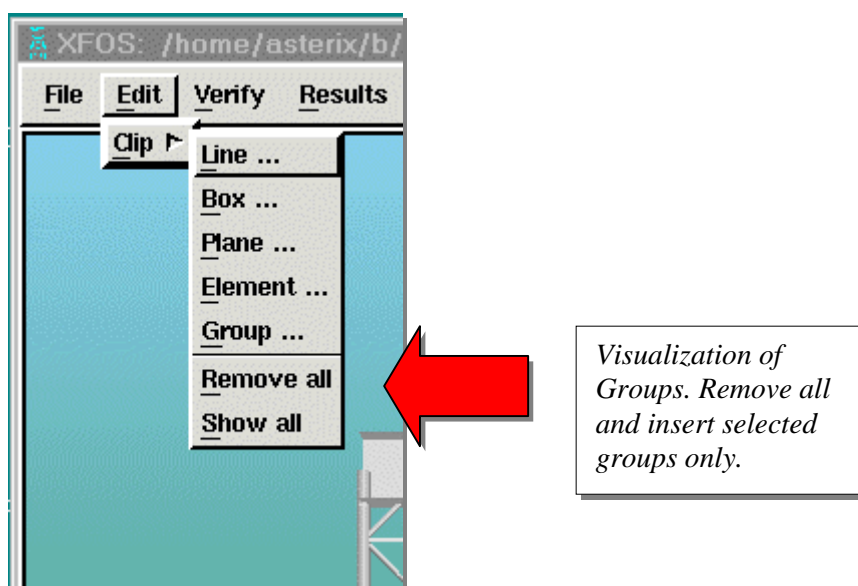

Visualization of Groups. Remove all and insert selected groups only.

Figure 3.5-1 Visualization of Groups in XFOS

4. New/modified input identifiers

Since last main release (7-7), following input identifiers are added/extended:

SPUDMAT	:	Define Spudcan Material properties (Sand or Clay)
SSH_LOAD	:	Local loads on shell substructures
BUCKMODE	:	Initial imperfections based on eigen value analysis
CHG_MAT	:	Change (override) material references defined on Structure File.