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SESAM EXAMPLE

Intact and Damaged Analysis of Three Storey Module Using the Superelement Technique

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Date: July 2022

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1   Introduction

This document explains how to use the superelement technique of Sesam to do the following analyses of a module structure with three identical storeys:

- Intact analysis with the three storeys modelled using a single superelement three times

- Damaged analysis with the bottom storey replaced by a damaged superelement model (missing two columns)

The intact model is shown in the figure below.

The analysis workflow is set up in Sesam Manager. To run the example create a new job (any name) and import the IntactDamagedThreeStoreyModule.zip file.
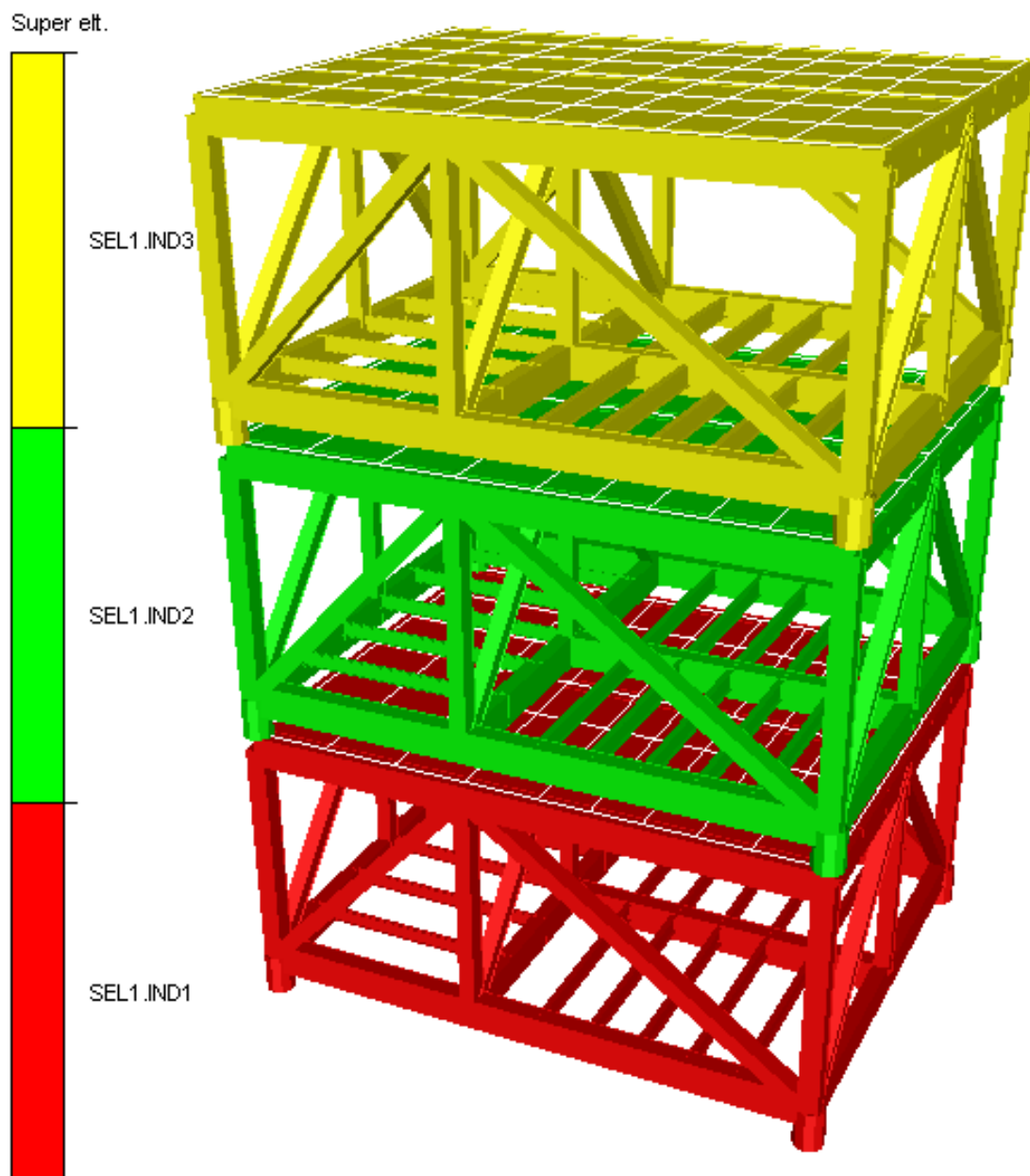

Figure 1-1   Three storey module structure in intact condition

Having imported the IntactDamagedThreeStoreyModule.zip file into a new Sesam Manager job the workflow analysis process below appears.
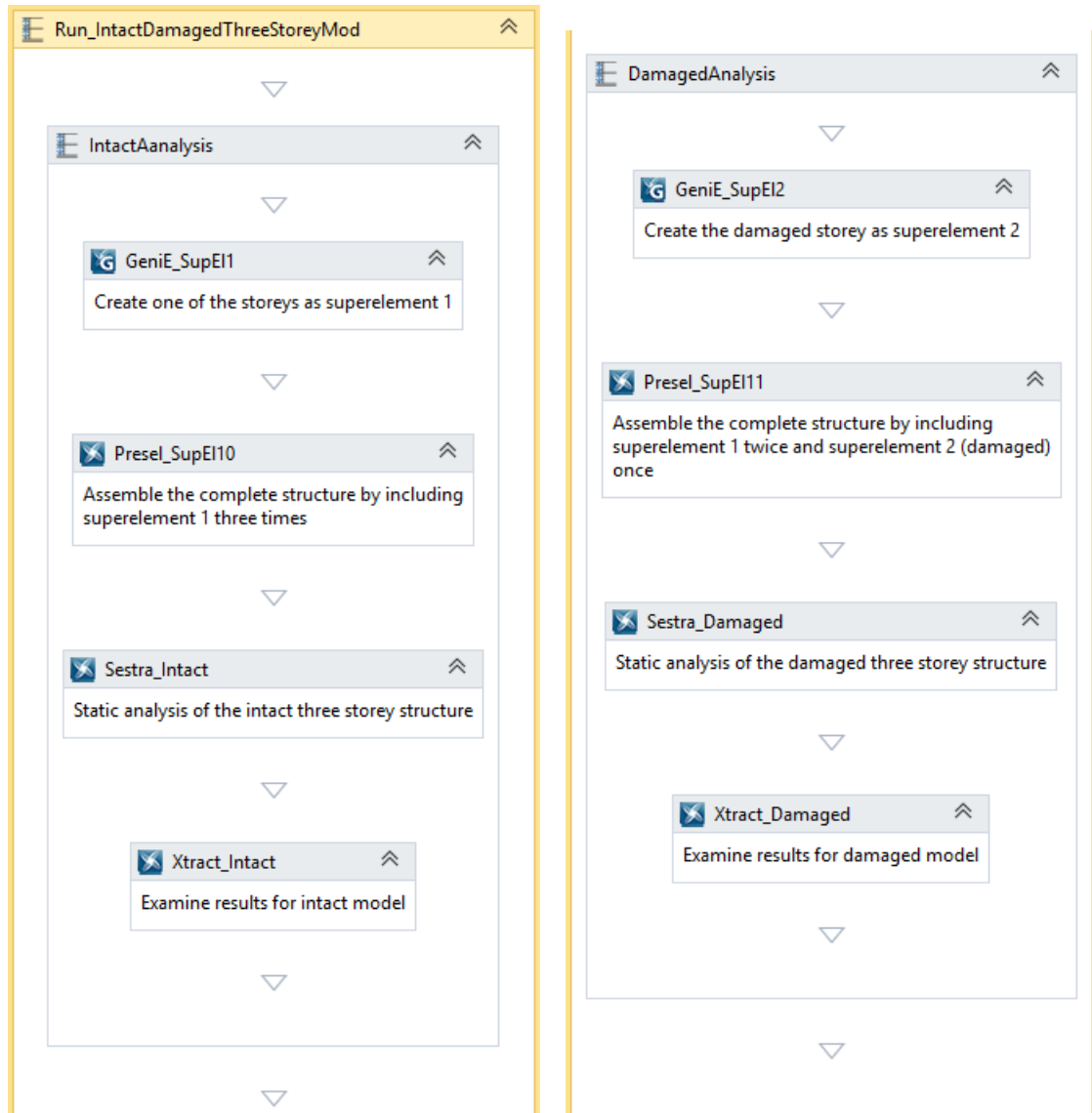

Figure 1-2   The Sesam Manager workflow

2 Intact Analysis

A sequence named IntactAnalysis includes the following activities:

- GeniE_SupEl1 – Modelling superelement 1 (T1.FEM) – a one storey module

- Presel_SupEl10 – Assembling the intact model by including superelement 1 three times

- Sestra_Intact – Static analysis of the intact model

- Xtract_Intact – Examine results

The GeniE and Presel activities are furnished with input files. The Sestra activity is a standard static analysis for which Sesam Manager creates the input file. The Xtract activity is ready to be run interactively by the user. The figure below shows beam axial forces for the gravity load case as displayed by Xtract.
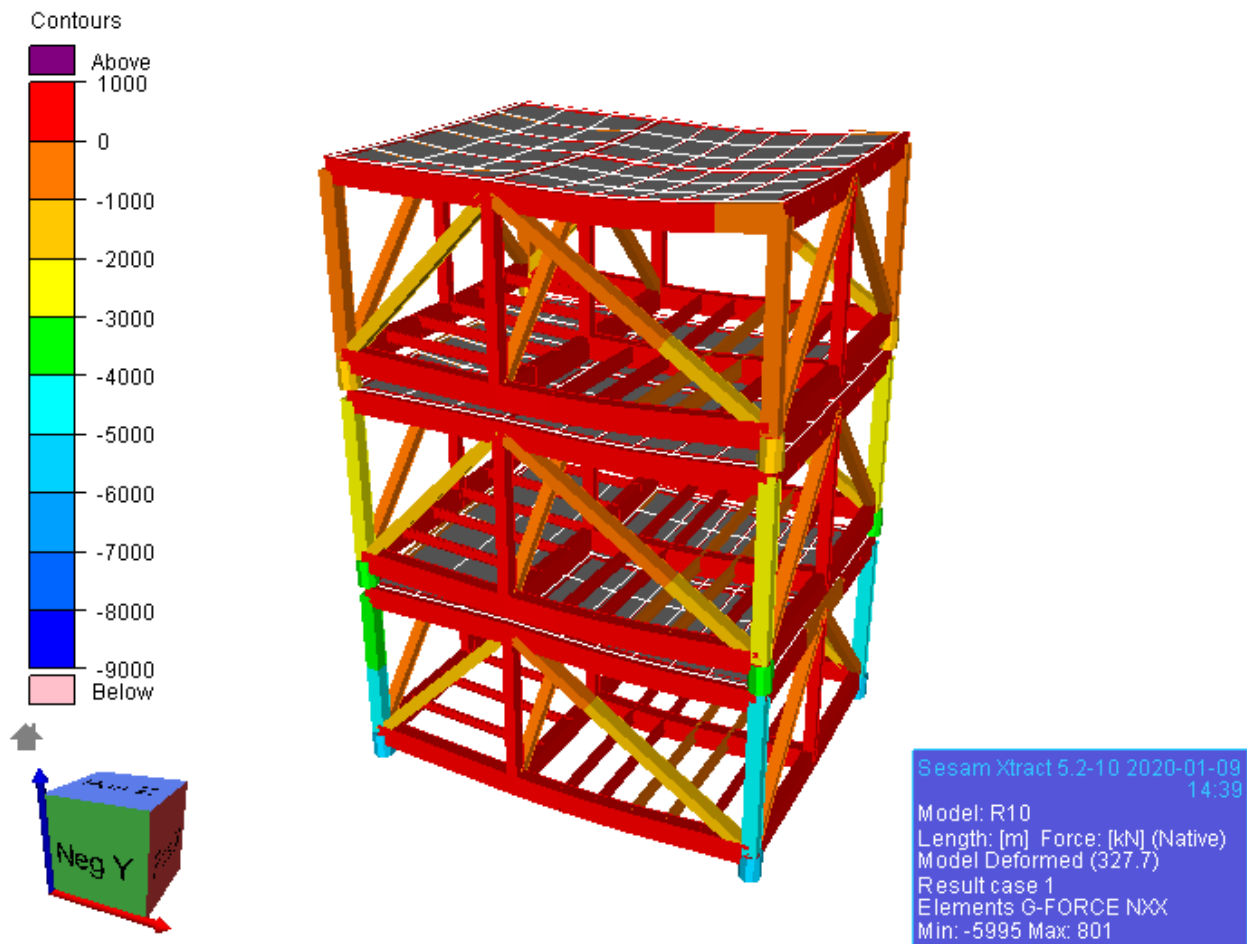

Figure 2-1 The axial forces for gravity – intact condition

3   Damaged Analysis

A sequence named DamagedAnalysis includes the following activities:

- GeniE_SupEl2 – Modelling superelement 2 (T2.FEM) – a damaged version of the module, two columns missing

- Presel_SupEl11 – Assembling the damaged version of the module as the bottom storey and two intact versions as storeys 2 and 3

- Sestra_Damaged – Static analysis of the damaged model

- Xtract_Damaged – Examine results

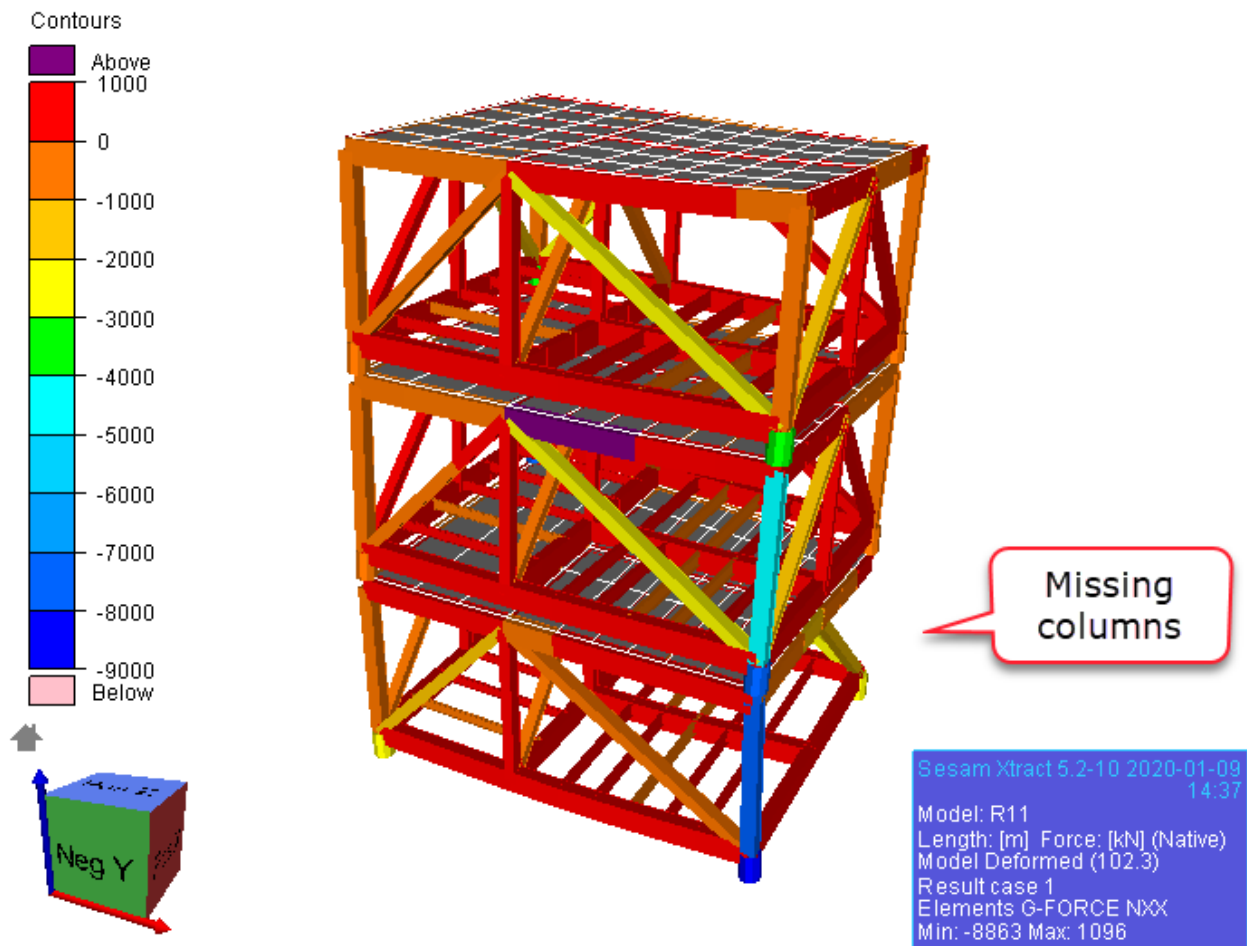The figure below shows beam axial forces for the gravity load case as displayed by Xtract.

Figure 3-1   The axial forces for gravity – damaged condition

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