1 INTRODUCTION

The computer program system USFOS is an efficient tool for progressive collapse analysis of space frame structures.

The USFOS frame analysis includes

- non-linear elastic element behaviour
- non-linear material properties
- non-linear structural geometry
- linear dependencies
- local buckling of members with tubular or rectangular cross section
- behaviour of damaged tubular members
- local flexibility of tubular joints
- fracture criteria and element rupture
- joint capacity check and plastic joint behaviour
- integrated algorithms for ship impact analysis
- automatic incrementation of loads with load step scaling
- nonstructural elements
- nonlinear springs
- inplane stiffness of deck plating
- restart

USFOS allows for the same finite element discretization as used in elastic analyses. Only minor modifications of the data set are necessary.

The purpose of the USFOS analysis module, its capabilities and theoretical basis are described in the USFOS THEORY MANUAL /1/.

The accuracy of the formulation, verified against analytical solutions, laboratory tests and analyses with alternative linear and nonlinear analysis systems is documented in the USFOS VERIFICATION MANUAL /2/.

This part of the USFOS documentation describes the practical use of the program. The basic features of the program are described, with an outline of the program organization. Special modelling considerations for USFOS analyses are presented, and the solution strategy of the program is discussed in detail.

The program input is specified, with analysis results and postprocessing features. This manual also presents simple numerical examples.