C++ IO support for various FEM exchange file formats

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1 Supported FEM file formats

Not all functionality defined for the exchange file formats is supported. The supported subset is currently mainly defined by the functionality supported in GLFrame rspt. the BMF file format.

More detailed information on supported functionality can be found in the according directories in the doc dubdirectory.

1.1 NASTRAN Bulk Data Format (BDF)

1.1.1 BDF Cards supported

	Name	Description	Read	Write
General				
	MAT1	Material definition	\checkmark	
	GRID	Grid nodes	\checkmark	
Elements				
	CTRIA3	3 node shaped shell elements	\checkmark	
	CQUAD4	4 node shaped shell elements	\checkmark	
	CBEAM	Complex beams	\checkmark	
	CBAR	Simple beams	\checkmark	\checkmark
	CROD	Trusses	\checkmark	
Element	properties			
	PSHELL	Properties for CTRIA3, and CQUAD4	\checkmark	
	PBEAM	Integral properties for CBEAM	\checkmark	
	PBEAML	Properties for CBEAM describing cross section	\checkmark	
	PBAR	Integral properties for CBAR	\checkmark	
	PBARL	Properties for CBAR describing cross section	\checkmark	
	PROD	Properties for CROD	\checkmark	
Load				
	LOAD	Load case combination	\checkmark	
	FORCE	Forces on Nodes	\checkmark	\checkmark
	MOMENT	Moments on Nodes	\checkmark	\checkmark
Misc				
	ENDDATA	Marker for end of input file	\checkmark	\checkmark

1.2 DNV GL Seasam Input Interface File (FEM)

1.2.1 FEM Cards supported

DATE GCOORD Nodal Coordinates 6-56 GNODE Correspondence between External and Internal		Name	Description	Read	Write	Page ¹
GCOORD Nodal Coordinates 6-56 GNODE Correspondence between External and Internal	General					
GNODE Correspondence between External and Internal				\checkmark	\checkmark	•
Node Numbering, and Number of Degrees of Freedom of Each Node IDENT Identification of Superelements Freedom of Each Node IDEND End of a Superelement Freedom of Superelements GELMNT1 Element Data Definition GELREF1 Reference to Element Data GELREF1 Reference to Element Data GBARM Cross Section Type Massive Bar GBEAMG General Beam Element Data GECCEN Eccentricities GELTH Thickness of Two-dimensional Elements GIORH Cross Section Type I or H Beam GLSEC Cross Section Type I or H Beam GLSEC Cross Section Type L-Section GPIPE Cross Section Type Tube Load BLDEP Nodes with Linear Dependence BNBCD Nodes with Boundary Conditions BNDISPL Nodes with Prescribed Displacements and Accelerations Nodes with Loads BNLOAD Nodes with Loads 6-35						_
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MGSPRNG Element to Ground 6-103 Misc	Migo	MGSPRNG	Element to Ground			6-103
	Misc	CCETMEMD	Cat (group) of Nodes or Floments (Members)			6 0 4
GSETMEMB Set (group) of Nodes or Elements (Members) 6-84 CUNITY G Specification of Legal Element Coordinate Sys						•
GUNIVEC Specification of Local Element Coordinate Sys- 6-92		GUNIVEC	<u>.</u>			6-92
tem MISOSEL Isotropy, Linear Elastic Structural Analysis 6-115		MISOSEL				6-115
TDSETNAM Name and Description of a Set (group) 4-7			10.			_
TEXT User supplied Text ✓ ✓ 4-10				√	1	
TDLOAD not documented				•	•	7 10

¹References page in "Technical Report: Sesam Input Interface File, File Description", Document id: 89-7012, Revision Number 9 / 01 November 1996