Flexcom 2022.1.3

Flexcom 2022.1.3 (October 2024) corrects several program faults identified in the preceding version, Flexcom 2022.1.2.

Our policy is to provide complete transparency to our Flexcom user community regarding any known software errors or limitations. Refer to Known Software Faults for further information on known faults in recent versions of Flexcom.

For your convenience, the fault corrections provided by Flexcom 2022.1.3 are also summarised here.

No.	Issue	Severity
1	Clearance Postprocessing fails if a Flexcom database contains vessel velocities and accelerations	Minor
2	Program may crash if Database or Summary Postprocessing encounters memory allocation issues	Minor
3	Point buoy feature can use a non-normalised local axis system	Minor
4	Program crashes if user does not have write access to working folder	Minor
5	Model View fails to display modal analysis solution	Minor
6	Shear7 interface fails to copy MDS file for "User" riser type	Minor
7	Floating body convolution integral not performed for quasi-static analysis	Minor
8	Flexcom may write non-zero current velocities above MWL in Shear7 DAT file	Minor
9	Truss element geometric stiffness not included for first solution iteration of quasi-static analysis	Minor
10	Hinge element issuing non-zero length warning message unnecessarily	Minor
11	Bending strain not required in ISO code check	Minor
12	Time history loads not allowed in static analysis	Minor

Issue 1: Clearance Postprocessing fails if a Flexcom database contains vessel velocities and accelerations

- **Related Topics**: Clearance & Interference Postprocessing
- **Description**: Vessel velocities and accelerations are not stored in the Flexcom motion database by default, but you can request their inclusion via the `*DATABASE CONTENT` keyword (`INCLUDE=20`). If you perform a clearance analysis using a database which includes vessel velocities and accelerations, it will fail and produce any clearance/interference results.
- **Workaround**: Omit the storage of vessel velocities and accelerations.

Issue 2: Program may crash if Database or Summary Postprocessing encounters memory allocation issues

- **Related Topics**: Database Postprocessing, Summary Postprocessing
- **Description**: Postprocessing runs which include a large number of elements, solution time steps, or postprocessing requests, may encounter memory allocation issues leading to program failure due to stack overflow. All large arrays within Flexcom's source code are allocated on the “heap” rather than the “stack” (both programming terms). But when large volumes of data are being passed between the postprocessing subroutines, a stack overflow can occur due to the temporary arrays which are created dynamically by Fortran. Flexcom's compiler settings have recently been adjusted to force Fortran to allocate temporary arrays on the heap rather than the stack.
- **Workaround**: There is no workaround, so you are advised to upgrade to Flexcom 2022.1.3 or later.

Issue 3: Point buoy feature can use a non-normalised local axis system

- **Related Topics**: Point Buoys, User-Defined Axes
- **Description**: The `*POINT BUOY` keyword can optionally reference a local axis system defined under `*LOCAL AXIS SYSTEM`. Local axis systems are normalised by Flexcom such that each component is a unit vector in a particular direction. However, this normalisation process happens after they are associated with point buoys, meaning that point buoy forces may be artificially increased if the local axis system definition uses vectors which have lengths greater than unity.
- **Workaround**: Ensure that all local axis systems specified in the keyword file are normalised.

Issue 4: Program crashes if user does not have write access to working folder

- **Related Topics**: All
- **Description**: Flexcom can crash if you attempt to run a simulation in a folder where you do not have write permissions. This situation has been seen to occur where several users are working on a shared server machine. So you could encounter an error message such as "*ACM stopped working. Error code 0x0000002F*". Flexcom 2022.1.3 and later versions handle this situation more gracefully, issuing a more meaningful error message, "*Unable to write to output file, please check that you have write permission for your working folder*".
- **Workaround**: Ensure that you have the necessary permissions when working on shared drives.

Issue 5: Model View fails to display modal analysis solution

- **Related Topics**: Model View
- **Description**: Flexcom can often fail to graphically display the modal solution, with a message stating "*Model view unavailable*". This is caused by an uninitialised variable in the motion database file which can cause the problem to appear sporadically.

- **Workaround**: Run the modal analysis with Flexcom 8.10. Or upgrade to Flexcom 2022.1.3 or later.

Issue 6: Shear7 interface fails to copy MDS file for "User" riser type

- **Related Topics**: Shear7 Interface
- **Description**: `*FOLDER OPTIONS` is used to indicate where the Shear7 input files will be generated and run. If you have specified `*RISER TYPE -> TYPE=USER`, Flexcom will fail to copy the MDS file to the required folder.
- **Workaround**: Manually copy the MDS to the Shear7 working folder.

Issue 7: Floating body convolution integral not performed for quasi-static analysis

- **Related Topics**: Floating Body, Wave Radiation Loads
- **Description**: Free decay tests are often used to evaluate the natural frequencies of a floating body and its mooring system in the various degrees of freedom. Given that free decay tests contain no wave loading, Flexcom by default does not compute the damping forces using a convolution integral of velocity time history and retardation functions. Flexcom does provide an option to manually switch on the convolution integral, but this only works for dynamic simulations
- **Workaround**: Set the analysis type to dynamic rather than quasi-static and specify `*WAVE-GENERAL -> FLOAT_CONVOLUTION=YES`.

Issue 8: Flexcom may write non-zero current velocities above MWL in Shear7 DAT file

- **Related Topics**: Shear7 Interface
- **Description**: If your current profile definition extends above the mean water line, Flexcom may write non-zero current velocities to the Shear7 DAT file for structural nodes which are located above the MWL.
- **Workaround**: Amend the current profile so that velocities are zero at all elevations above the MWL.

Issue 9: Truss element geometric stiffness not included for first solution iteration of quasi-static analysis

- **Related Topics**: Truss Element
- **Description**: Geometric stiffness relies on the presence of a positive effective tension, but no effective tension results are formally computed until after the first solution iteration has been completed. If you are modelling a straight section, Flexcom automatically assumes a nominal effective tension value of 1N in the initial static analysis to facilitate the inclusion of a token geometric stiffness contribution. However, if you need to begin with an initial quasi-static analysis rather than a static analysis, this contribution is not present and a solution indeterminacy may occur.
- **Workaround**: Set the analysis type to static rather than quasi-static. Or try to model the straight section as a catenary by slightly increasing the line length or offsetting one of the end points. This will activate the Cable Pre-Static Step and if a catenary profile is successfully computed, it will ensure a realistic effective tension distribution is available for the first solution iteration.

Issue 10: Hinge element issuing non-zero length warning message unnecessarily

- **Related Topics**: Hinge and Flex Joints
- **Description**: Flexcom issues a warning message if any hinge element has a non-zero length. However, the check on nodal separation is too stringent and you may receive a warning message even if both nodes are coincidental.
- **Workaround**: Check the hinge element length via the *ELEMENT PROPERTIES* section of the OUT file. If the element length is listed as 0.00 (metres or feet), you can simply ignore the warning message.

Issue 11: Bending strain not required in ISO code check

- **Related Topics**: Code Checking
- **Description**: This is a software inefficiency rather than a fault. Bending strain is computed and output as part of the ISO-13628-7 code checking for completion/workover riser systems. This computation is unnecessary and has been removed.
- **Workaround**: Ignore the bending strain outputs.

Issue 12: Time history loads not allowed in static analyses

- **Related Topics**: Point and Distributed Loads
- **Description**: This is a software inefficiency rather than a fault. Time varying loads are not permitted for static analysis. Although this sounds logical, it possible to specify time variables in Flexcom static analysis to facilitate load ramping, and so it can be useful to allow time varying definitions with respect to loads.
- **Workaround**: Set the analysis type to dynamic rather than static. Or perform a series of restart analyses should you need to perform the analysis statically.