FS2000 Distribution IN041– Release Notes 28/11/25

FS2000 GUI (Version 8.1.145) -Editing Load Combination. The capability to edit all model load combinations in a single text file now exists. It is now possible to copy a selected load combination (template) to a range of combinations. Using this template approach and the new editing feature simplifies combination management.
The picking of beam and couple elements in the GUI has been revised and it is not necessary to pick only the centre of the element for it to be selected. Picking any point of the line will make the selection. The location of beam end offsets and beam loading may also be based on the location of the line pick point.
If using the Copy Sub-Model routine within the same model it is now not necessary to exit the Definition Task to paste from the FS2000 paste buffer.

Error Correction (Loada.exe V8.1.57) Pre-combined Cases with Temp and Pressure Axial Strains Defined Ambient temp was not being initialised between cases. This effects bends in a linear solution and all elements in a non-linear solution. Older code Workaround - make the P & T case the last in the combination or use Dynamic Load Case Merging. If the combination contained a Generated Load Case, then the Load Factors applied to P & T axial strains were incorrectly applied (recipient-current reversed). This effects bends in a linear solution and all elements in a non-linear solution. Older code Workaround – don't pre-combine, use a time history combination for non-linear solutions or post-combine for linear solutions.

FS2000 Distribution IN040B– Release Notes 24/06/25

FS2000 GUI (Version 8.1.144) -Correction-When selecting coincident nodes for couple definition an overflow crash could occur if too many are selected.

3-D Standard Solver- Applies Taylor rigid link approach to 4 Node shells if Z warping > 1E-6. Added MITC3 3 node shell element. Added ANDES solution option for in-plane membrane action in 3-Node shells.

3-D Non-Linear Solver- Correction. If non-unity load factor were used in history combination, then the element loading in linear elements and bend elements may be incorrectly evaluated. This does not affect non-linear beams nor any elements that do not have define element loads i.e. it's a local element effect. It does not affect the displacement solution. It would be more apparent in pressured pipe solutions.

FS2000 Distribution IN040– Release Notes 30/01/25

FS2000 GUI (Version 8.1.143) NA command (FS-Wind) & NAV(FS-Wave) now included in Node renumber routines.
Changed Fatigue damage UR plot so that exponent format can be displayed in legend list.
Moving Load Generation – Changes ULData to binary format
Shell elements mass effects (gravitational loads) included in pre-processing (LOADA 8.1.56) load summations.

CMotion (8.1.30) Load Generator. Shell mass effects included in mass definition cases.

Seismic (8.1.17) Load Generator. Shell mass effects included in equivalent in mass definition cases.

DyNoFlex – Dynamic solutions can now be re-started from static solutions. Total component strains and corresponding stresses included in listing for Solid element plasticity. Solid and shell element plasticity can now be defined by Ramberg-Osgood and piecewise linear curves. Type 6(7) and Type 6(11) plastic pipe now include the effects of radial stress/strains when evaluating effective VM Eq plastic strains.

AISC-360 (8.1.21) – Updated to the 2022 Edition – Corrected an error (introduced V8.1.17 4/2/20) that can produce an allowable axial capacity (I beams) which is too low (conservative result).

FS-TubeJoint (8.1.47) updated the ISO19902 checks to the 2020 edition of the code & AISC-360-22(not significant). Added error warning ID to the Help file.

ISO19909 (8.1.14) Updated to the 2020 edition of the code (most significant changes are the inclusion of high torsion, hight shear in combined load checks).

OffFat (FATIG1 -8-1.11) – Efthymiuo Axial T/Y Joint Used F1 short chord correction (chord saddle) - changed to F2 in line with code requirements for the general use case.

FS-Pipe (8.1.47) DNV F201 Riser System added. ASD Bend checks can be obtained using the same result cases used for the factored loading approach in F101 and F201 checks. Added option for exact longitudinal stress evaluation.

FS-Graph (Ver 8.1.25) Added DyNoFlex Plastic(Frame Plasticity) UR plot

FS2000 Distribution IN039– Release Notes 18/06/24

FS2000 GUI (Version 8.1.142) Plasticity routine revised. Accumulative strains in solid elements plasticity now evaluated (contour plots and listings). Ongoing Help file updated.

DyNoFlex – Plasticity routines updated – convergence improved.

FS2000 Distribution IN038– Release Notes 08/04/24

FS2000 GUI (Version 8.1.141) Plasticity in Type 15 Spar element is now available using stress-strain definition. Ambient temperature does not initialise when exiting Load Definition TASK. Ongoing Help file update.

AISC/API (8.1.38) – Output update to show API-RP2A version used in output header.

PipeProperties Utility (8.1.19) – Added kinematic axial couples for cycling option.

FS2000 Distribution IN037– Release Notes 25/01/24

FS2000 GUI (Version 8.1.140) New 4 node thick shell added-Type 52, based on the MITC4 plate bending formulation. Added shell element foundation stiffness (Winkler support). Contour plots of

Shell element forces including Wood-Armer moments can be plotted. Bug fix – UR contour plot legend sometimes not shown. Gravitational loads on shell elements now included in GUI loading summations.

OUT6(8.1.27) – A Sub-Case listing of Shell element forces can be created.

MOUT6(8.1.34 – A Sub-Case listing of Shell element forces can be created.

FS-Wave (V8.1.70) Added mass for dynamic solutions (DyNoFlex & Frequency) now has 3 directions – previously unidirectional.

TubeJoint (8.1.46) Correction - Effective Width Capacity for moments was not evaluated correctly for SI Unit models that used properties from US Unit Property Libraries (fix for earlier versions is to convert library to SI Units library).

FS2000 Distribution IN036A– Release Notes 23/08/23

FS-Wind (V8.1.68) Correction PCOF command in WIN file would have and extra line feed for codes>9. Workaround is to edit WIN file.

FS-Wave (V8.1.69) Added MacCamy-Fuchs correction option for large D/L near vertical cylinders.

Fatigue Modules Various minor update to improve operability. Added fatigue tutorial.

FS2000 Distribution IN036– Release Notes 22/05/23

FS2000 GUI (Version 8.1.139) Time history displ acement plots for shell elements added. Moving Load generator added (DyNoFlex solutions) with emphasis on pipe slugging flow.

DyNoFlex - Increased maximum case number for 999 to 9999. Fatigue – SN fatigue assessment (Rain flow cycle counting) of time history response case added. Static Stabilisation (artificial damping) can now be applied to static solutions.

TubeJoint (8.1.45) Removed Chord face failure criteria for hollow section X joints (not applicable to EC3 X joints).

FS2000 Distribution IN035– Release Notes 07/01/23

FS2000 GUI (Version 8.1.138) Added Shell offsets capability. Piping mesh generators for elbows etc (quad shells) added to the Frame Wizard utility. Non-linear pulley element added. Change the approach to local offsets applied to element with 3rd node orientation – now permitted to reference itself.

FS-Pipe (8.1.46) HISC screening – Minimum thickness used for all stress checks (previously hoop used minimum and longitudinal uses corroded).

AISC/API (8.1.37) - Hydro check in Interactive mode disabled in an earlier update. Was always applied when run from FS2000's GUI or in Batch mode.

FS-Wave (8.2.65) - Added Solitary wave theory. Wave & Current Profile plot now use common normalisations so that the relative magnitudes are apparent in view panel. Command line for generating data for dynamic analysis modified to include specific WAV files.

DyNoFlex - Added a new non-linear pulley element (Type 17) and Shell offsets. Improvements(convergence) to elasto/plasto elements. No-linear stress-strain curves can now be define using Ramberg-Osgood relationships for non-linear pipes. Added 'Recovery Mode' option that enables restart after every converged time step. Gap elements – lateral friction can be defined as a function of displacement.

OffFAT (FATG3 8.1.10) – Corrected bug when using SN curves with zero wall thickness exponent. (previously would make the value unity). Wall thickness for pipe now obtained from properties (previously only tubular joint pipe walls were obtained).

FS2000 Distribution IN034– Release Notes 11/04/2022

FS2000 GUI (Version 8.1.136) Improved GUI for multi-monitor use. Can now use in other than primary monitor without loss of input forms. Correction – Unequal Angles (L sections) with small Alpha angles could rotate to the principle axis.

DyNoFlex - Added friction model choice to Type 15 Couple (Contact). Added moment curvature formulation for Type 16 Beams.

FS2000 Distribution IN033– Release Notes 09/03/2022

FS2000 GUI (Version 8.1.135) Non-defined beam offset definition error eliminated. The Version 8.2.130 update introduced an operational error that would in some situations add offsets to beam elements during their initial definition (only following a model save). These offsets (usually zero) were always visible both in the GUI and the listed output and could be easily deleted.

FS-Pipe (8.1.45) Removed the requirement for Exclude Hoop Stress to be active to plot Bend URs

FS2000 Distribution IN032– Release Notes 02/11/2021

FS-Pipe (8.1.44) Updated DNV F101 to 2021 Edition

Standard 3_D Solver - Corrected a compilation error. P-Delta solutions with Type53-0 could crash the solution. Frequency solver – an intermediate version looked for fsfprofv.ini and not fsprofv.ini. Potential for shell buckling solutions to fail eliminated.

FS-Wind (8.1.28) Correct error (Axial drag) with perimeter definition for non-pipes from earlier update (could crash the solution).

FS2000 GUI (Version 8.2.134) New 'SECT' command added which enables properties to be retrieved from section libraries using a command line. Extended Properties can be applied to models with rigid links. Elements with rigid links can be grouped by elem attribute ID. Corrected an issue that if rigid links were changed to normal beams then those forces in that beam would be incorrectly reported. Plane property generator – possibly erratic plastic modulus.

TubeJoint (8.1.43) Error Trap missing - Would stop in Batch mode if results case did not exist .

DyNoFlex - Error Correction: Would fail to complete solution if the model has shell elements and sub-cases were requested at intermediate time steps. The 4 node Type 51 shell element now has Plastic and Large Displacement capability for use in DyNoFlex non-linear solutions.

Heat Transfer Solution – Added transient non-linear solution capability.

FS-Wave (8.1.63) Increased maximum phase increments for a stepped wave from 48 to 72.

FS-Crack (8.1.23) Can now read stress point data from a DyNoFlex time history solution. This enables fatigue lives to be obtained using a sequential cycle count (rainflow) . Can be applied to fracture mechanics or SN based fatigue methods. OffFat Tubular joint SCF can be automatically included enabling crack growth in jacket type structure to be assessed for specific random or regular seastates.

FS2000 Distribution IN031– Release Notes 25/6/2020

FS2000 GUI (Version 8.2.133) Plastic strain labels now indicate strain.

TubeJoint (8.1.42) AISC-360 Joint check added to tubular joint checker.

AISC-360 (8.1.18) Member check – Corrected error that code check would only operate in interactive mode.

FS2000 Distribution IN030– Release Notes 6/6/2020

FS2000 GUI (Version 8.1.133) Added Type8 couple which can be used for laterally impacted tubular assessments (energy absorption and moment capacity reduction based on Ellinas & Walker/DNV dent models).

Improved accuracy of the plane area property generator – now independent of element size.

DyNoFlex (71) Type 8 Couple added.

Post-Processing (POST6.exe V8.1.27) Seismic response (RSM) cases can now be combined with DyNoFlex non-linear results. Necessary in cases where a frequency solution used in RSM is based on the mass and stiffness obtained from a DyNoFlex restart solution.

FS-Pile (8.1.43) - Option to generate Type7 non-linear couples to represent soil springs.

FS2000 Distribution IN029B– Release Notes 16/03/2020

FS2000 GUI (Version 8.1.132) Minor graphical correction. In the last update (8.1.131) couple orientations using a reference element would always be shown in the global axis, if the ref element was a Type 0 beam element (solution valid still). Couples now show correct orientations as previous versions.

FS2000 Distribution IN029– Release Notes 04/02/2020

FS2000 GUI (Version 8.1.131) Updated for current solution enhancements.

Geometric Property Utility – Now includes double angles and an option to use the principal axis or major geometric axis of angles in the major beam axis.

AISC-360 (8.1.17) Updated to 2016 edition. Added double angles checks.

EC3 & All member code checker updated for double angles checks.

Eigen Solver Dynframb (24) – Added Type 60 (membrane) elements to solution

FS-Seismic (Ver 8.1.16) Lateral Force Method Added IBC, ASCE 7 and EC8 design codes

FS-Seismic-Response (Version 8.1.9) Added missing mass mode capability for high frequency rigid mode response – frequencies > ZPA. Added the ability to obtain a signed response based on the signage of a user selected dominant mode.

FS-Fracture (Version 8.2.22) Improved Rainflow counting procedure & user input control.

DyNoFlex (70) and 3-D Non-Linear Solvers

Added Type 60 (membrane) elements to solution.

Changed irregular wave stretching method from Vertical to Wheeler+. The Vertical method was observed in some cases to give unrealistically high motions.

Error Correction - In some case the reported loading in a Node to Ground Type 7 couple could be incorrect (initialisation error). Unlikely to influence the solution unless the couple was relatively very soft.

Plastic pipe element (Type 6[7]) enhanced. Stress integration points increased from 8 to 12 and kinematic multi-linear material model added (Type6[10]). Kinematic multi-linear model added to Type 7 couple element and to moment curvature beam (Type6[10].

Moment Curvature Utility – Enhanced new utility (last release) that evaluates the moment curvature (RC table entry) for layered pipe with defined non-linear material properties. This utility can now be used to evaluate plastic cyclic stress-strain behaviour and can be used to define initial plasticity conditions (plastic and accumulative plastic strains) for DyNoFlex solutions following such cycling.

FS2000 Distribution IN028– Release Notes 20/05/2019

FS2000 GUI (Version 8.1.130) Global distributed element loads (defined by element or by property code) can be applied as projected loading i.e. applied to the projected element length normal to the direction of the load.

Heat Transfer – 2 & 3D finite element types can be used to evaluate temperature distributions due to conductive and convective heat transfer etc. Creates load (temp definition) cases (nodal temp definition) for thermal expansion stress solutions.

Type 0 and Type 7 node to node couples now include the effects of shear offset and can therefore now be used to model rigid or semi rigid offset links (reference to a coord system or beam eliminates shear offset effect). Moment components for reactions and couples can be combined in one plot.

FS-Pipe (8.1.43) HISC Screening updated to comply with DNV RPF112 Ed2018

FS-Wind (8.1.27) - Member wind drag can now be evaluated using the velocity component method or projected wind pressure method (previously only component method available). Internal Area and Perimeter data for box sections and other standard sections now automatically entered to the model Coefficient Data.

FS-Wave (8.1.61) - Internal Area and Perimeter data for box sections and other standard sections now automatically entered into model Coefficient Data. Option for drag loading on non-pipe sections to be evaluated in a similar manner to that for pipe sections (less conservative option).

DyNoFlex (69) Added ability to define both nodal loads and displacements as a function of time step – See moving loads in Help file. Type 6 Tension-Compression only elements now work without the Plastic option requiring to be active (convergence also improved). Time history wave loading solutions are made more compatible with quasi static solutions: External pressure (Po) option available; Stream Function and Stokes 5^{th} wave theory options added; Hydrodynamic loading parameters can be lumped at node locations. Added thermal strain solution capability to solid elements. QM6 solution option added to solid elements. Correction - The frame plasticity moment capacity Type 6 (1-5) beams could converge to an invalid value if the axial limit was reached and the

moment capacity was less than 1E-10 (unlikely in any real structures). Correction - Solution would crash with when gravitational loads applied to 2-D solids.

FS-Plot - Stress scan of all time steps for all elements enables maximum stress for each elements to be identified from a single plot of stress vs element (time history solutions).

Moment Curvature Utility - New utility that evaluates the moment curvature (RC table entry) for layered pipe with defined non-linear material properties.

FS2000 Distribution IN027– Release Notes 16/07/2018

FS2000 GUI Version No 8.1.129

DyNoFlex (67) Added user defined nodal loads as a function of time step – See moving loads in Help file.

FS2000 GUI (Version 8.1.129) EMOD command added to the model interpreter. Modification of individual element attributes e.g. property code.

FS2000 Distribution IN026 – Release Notes 08/05/2018

FS2000 GUI Version No 8.1.128

AISC_360 (8.1.16) The effective area for Type 1&2 beams was incorrectly evaluated. Only affected tensile capacity in sections in which the tensile capacity was governed by UTS.

DyNoFlex (66) Changed the material model for Type6(7) plastic pipe. It now evaluates accumulative plastic strain and includes the effect of hoop stress.

FS2000 GUI (Version 8.1.128) Corrected an error that occurred when renumbering using the 127 release – Effects Load cases. If elements or nodes are deleted and the load case still contains their definition, depending upon their position, the loading may be applied twice.
The plastic modulus for Type 1&2 Beams were incorrectly read from the library - only effects non-linear solutions (frame plasticity model)

FS-Pile (8.1.40) - Added the capability to control element size distribution when user defined PY data is used. Modified the way the Stiff Clay Factor is used for stiff clay P-Y curve generation.

TubeJoint (8.1.41) Added chord can length outstand as a user define parameter (evaluation of Lc - API Cl 7.3.5 thickened can). Corrected minor error Qu for T joints (API) used 35 instead of 36.

FS2000 Distribution IN025 – Release Notes 23/11/2017

FS2000 GUI Version No 8.1.127

FS2000 GUI (Version 8.1.127) Node and Element renumbering (compression) now updates all model definitions – Load case etc.

FS-Wave (8.1.60) – Plots of defined profiles (marine growth etc.) added. Mass summary in WMass file listed in Wav file.

Eigen Solver Dynframb (23) – Added Determinant Search Method and Eigen Value Shift. Solver now also reads DyNoFlex restart files (Stiffness and Mass) for frequency solution. Frequency cut-off option added.

DyNoFlex (65) Corrected error writing mass from a frequency restart solution. Only effected solutions if the DyNoFlex frequency solution was to be used for a subsequent modal analysis (unlikely). Added a Type 7-3 Couple option (bi-linear without strain hardening). Corrected Couples 7-1 & 7-2, only worked as N to N. Type 7 Couples had Type 10 behaviour disabled (effected pipe walking models) – re-enabled.

TubeJoint (8.1.39) Added optional API RP2A Minimum Capacity Check –Clause 7.2.3

FS2000 Distribution IN024C – Release Notes 01/06/2017

FS2000 GUI Version No 8.1.126

Flange Checker (8.1.8) Added warning to prevent saving table with zero entries.

Seismic Response (LOADDISP) – Corrected error with elements with defined offsets.

POST6 (8.1.24) – Updated in to accommodate the Seismic Response fix.

C*FS-Wave (8.1.59) – Added a warning if Stokes 5th converges to an invalid wave length in deep water (long period swell where Airy theory should be used).

FS-Wave (8.1.58) – Added environmental dependant wave spreading and current blockage factors.

FS2000 Distribution IN024 – Release Notes 5/05/2017

FS2000 GUI Version No 8.1.126

Spectral Fatigue – Improved the speed of the frequency response cases.

DyNoFlex Improve convergence efficiency when using the CFACT command, Type 15 for large displacement strains and Type 15 for define axial force.

Error Correction Some –ve constants for Type 7 Couples were made zero when the STAB command was interpreted.

Modal & Frequency Response. Modified modal solution output to accommodate dynamic memory allocation when undertaking response analysis- previously limited to 2000 nodes.

FS-Pile - Error correction 2-D Pile analysis solution option neglected pile tip spring.

FS2000 Distribution IN023B – Release Notes 14/02/2017

FS2000 GUI Version No 8.1.125

B* Frequency/Buckling - PDelta Effects Took out soft spring which could produce spurious first modes. Corrected minor operability error – Stability function option was disabled (shear deflections always included).

B* Minor Change in Waveloader and Windloader IDE for Windows 10

B* OFRAME (Version 8.1.24) – Reinstated a previous stress routine for the 2-D QM6 element. The routine improved direct stress evaluation but degraded shear stress evaluation in coarse meshes unless nodal averaging undertaken.

B* DyNoFlex (8.61) – Added Rayleigh Beta damping for non-linear elements using an additional defined beta coefficient. Corrected a potential error when plotting incremented displacements. Auto time steps now can be applied to dynamic solutions. Improved Line Search and Time Predictor convergence control.

B* CMotion 8.1.28 – Minor Error correction – Taper sections were assumed to be uniform for the Heave case if a defined 'g Force' was specified for the heave definition.

CMotion (Version 8.1.27) – Added new UDL command that should have been included in INO21.

FS-Seismic (Version 8.1.14) – Added new UDL command that should have been included in INO21.

Seismic Response (8.1.6) - Added CQC, 10% Group, DSM and ABS Sum modal combination method to the spectral response solution. Added the capability to obtain the signed response for specific individual modes. Dynamic memory allocation implemented (force from displacement routines).

Dynamic Modal Response (8.1.21) – Added INFORCE command to support motion response. Added Rayleigh damping. Added directional modal mass participation information to the output. Corrected error associated with the reported displacements from a frequency support motion solution (forces were ok).

FS2000 Distribution IN022 – Release Notes 25/08/2016

FS2000 GUI Version No 8.1.125

POST6 (Version 8.1.22) – Combining Dynamic Response results and linear results was disabled in an earlier update.

All Member Design Modules (AISC etc.) – Option to check at 21 points on span with output restricted to the ends and the location of the maximum mid span UR.

FS-Wave (Version 8.1.56) - Added graphics plot showing symbolic structure/seabed and wave & current profiles.

FS2000 Distribution IN021 – Release Notes 06/04/2016

FS2000 GUI Version No 8.1.124

FS2000 GUI (Version 8.1.124)- Print file button in file viewer would fail with long file specifications. Couple Enter button was disabled for Node to Ground couples. Added input forms to GUI for non-linear load effects definition e.g. CDISP, ESTRA. A new load command was added to apply global uniform element loading (UDL). Corrected a bug that caused the GUI to lock if multi-selection was used to delete node or element loads and when loads were applied more than once.

FS-Pipe (8.1.42) VM Equiv Stress Checks added to HISC Screening

FS-Pile (8.1.38)- Pile element generation, pile head coordinates can be entered by node label reference. Multiple piles connected to defined model nodes using one interpretation file. Setting saved enabling easy pile generation.

Batch Process (8.1.19) – Added option to minimise solution window on start-up- prevents loss of focus of other Window applications during batch operation.

AISC Member (8.1.33) – Hoop hydro buckling length will be based on Llb if defined and not equal to the element length.

DyNoFlex – FS-Print now includes Stress, velocity and acceleration time history plots. Older solutions required to be re-run. Corrected previous induced error when using RAOs with a random seastate. Changed still water surface penetration routine to be consistent with FS-Wave approach.

Dynamic Response (8.1.20) – Corrected formatting of EFOUT stress output.

Frequency Solution Bug Fix – Would crash if P-Delta effects were included and last element in the model was a bend element (Type 2 or 3).

LOADA (8.1.51) Contents weight effect on bend omitted from load case summation (format printing error)

FS2000 Distribution IN020 – Release Notes 06/08/2015

FS2000 GUI Version No 8.1.123

Flange Checker (8.2.7)– Updated to account for external pressure definition (Po).

Tubular Joint Check (8.1.38) ISO 19902 Code Qg (Eq 14.3-8) for overlapped K joints was set to 1 if less than 1.

ISO 19902 & API LRFD Member Check - Corrected operation anomaly with non CHS beam elements (could crash or fail to check).

EC3 moment capacity (due to axial load) for CHS was disabled. Added option switch (global file) for linear interaction (Eqn 6.2) and to use resultant moment with CHS sections.

DyNoFlex – Introduced moment curvature stiffness definition for Type 6, 7 & 8 beam elements.

3-D NonLinear – Introduced moment curvature stiffness definition for Type 6, 7 & 8 beam elements.

FS-Pipe(8.1.41) – The optional defined temp de-rating factor(global) was disabled for B31.4 and B31.8 offshore codes.

LOADA – Overflow error fixed. If extended pipe properties are applied to bend elements in a model size greater than 8000 elements it would crash.

FS-Wind – Wind profile is now cut off below the ground datum elevation, previously it followed the profile definition.

FS2000 Distribution IN019 – Release Notes 23/04/2015

FS2000 GUI Version No 8.1.122

FS2000 GUI (Version 8.1.122) Removed potential DyNoFlex result case conflict when result case is open in Output Task. Removed 2-D Eigen solution options.

Eigen Frequency Solution – BugFix-Error introduced in 8.1.117:Pre-combining mass load cases caused the solution to fail.

DyNoFlex – Added bilinear isotropic and kinematic memory model springs to Type 7 couples.

EC3 – Shear capacity in an I beam (Eq 6.26) cut off at 0.8 Torsion to prevent –ve roots, should have be 1.25.

LOADA - Waveloader cases would not tolerate a zero area property (non-linear solver only). Updated to be compatible with older versions that did.

FS2000 Distribution IN018B – Release Notes 09/03/2015

FS2000 GUI Version No 8.1.121

LOADA – Corrected an error introduced in IN-018. Pressure effects missing when pre-combining generated waveloads with other cases.

FS2000 Distribution IN018A – Release Notes 24/02/2015

FS2000 GUI Version No 8.1.121

This version requires a dongle update that will lock out all older versions

All load cases (prior 8.1.20) are required to be re-run following this update.

FS2000 GUI (Version 8.1.121) Fixed bug with international time zones. Added the following interactive commands:

Beam Elem menu: Insert End Spring/Couple.
Couple Menu: Reverse connectivity and Select reference element.
Couples can be added to coincident nodes using the SelectBy option

FS-Pipe - Corrected minor conservatism in F101 combined loading check (2/Root(3) factor was included in pressure component)

AISC 360 Corrected Error F4(non-compact webs) clause used for compact webs resulting in the use of slightly lower lateral buckling capacities

FS2000 Distribution IN018 – Release Notes 14/02/2015

FS2000 GUI Version No 8.1.120

All load cases are required to be re-run following this update.

Explicit external pipe pressure definition option capability added to standard load cases.

FS-Wave now has the option to include static external wave pressure load cases.

FS=Pipe can use the external pressure for hydro pipe buckling checks. The F101 thick pipe warning is now only a listing and does not change the UR value as version after IN016 release.

FS-AISC, FS-ISO19902 can use the external pressure for pipe hydro buckling checks.

FS2000 GUI (Version 8.1.120) Added delete button to report collator and prefixed secondary list names with a – to prevent possible deletion error when purging results.

All Solvers – Shear deflection effects now included in P-Delta analysis. If Shear area is zero stability functions are used for beam P-Delta effects, otherwise the more commonly used form for the Kg matrix is used.

Standard 3-D – Pipe Pressure & Elem Thermal Expansion effects now include in P-Delta analysis. This can now be used to assess P & T effects on Eigen frequency and Eigen buckling analysis.

DyNoFlex – Modified program so that element loading due to P&T effects are fully included in Type 0 (linear beams) elements when the non-linear large displacement lumped loading option is active. Tension/Compression only property added to Type 16 beams and time history plots can be displayed. Initial strain on Type15 elements is now effective. Improved sol'n convergence for Type 15 (tension/compression only) elements. Corrected error - Type50 shell stresses not processed (error introduced in IN017 when Type53 were added). Reaction forces for Shell element are now included

POST6 – PD reactions not listed separately in the results when a PD was applied on a restrained node. It only affected the results from the non-linear solvers.

FS2000 Distribution IN017A – Release Notes 11/11/2014

FS2000 GUI Version No 8.1.119

FS-DyNoFlex(8/11/14) – Hydrodynamic Inertia Loading damping. This damping of structure accelerations produced less accurate inertia loads for elements that have significant dynamic motion relative to the wave motions. This has been revised to have a lesser effect. Only noticeable in inertia dominated floating structures. (Note this damping was removed in 8.1.124)

FS2000 Distribution IN017 – Release Notes 25/10/2014

FS2000 GUI Version No 8.1.119

FS2000 GUI (Version 8.1.119) networked licencing is now independent of local time zones. In this version the dongle uses the time and date setting from DK2 Host (local or server). The dongle settings have to be updated to use this version. Contact FS2000@aes-uk.com to obtain this update.

FS-CMotion – Corrected load evaluation error on elements with aft end only moment releases (Type 2 Release).

FS-Pipe – HISC screening check added. Explicit reference cases for B31.xx codes made consistent between the different codes.

MOUT6 – Correction – Aft end stress evaluate incorrectly on Type 2 and Type 2 beams (bends) if No of Span Location > is specified higher than the default value of 2.

FS2000 GUI Correction - Aft end shear stresses on tapered beams incorrectly plotted.

Dynamic Response – Corrected lost link error to response Help file – Error linked to core module Help after plotting results. Minor general operational updates added.

FS2000 Distribution IN016A – Release Notes 22/5/2014

FS2000 GUI Version No 8.1.118

FS-DyNoFlex – Corrected error introduced in Rel IN014. If linear option is used (unlikely with this non-linear solver) the Type 0 beam elements are added twice to the global stiffness matrix.

FS2000 Distribution IN016 – Release Notes 22/5/2014

FS2000 GUI Version No 8.1.118

FS2000 GUI - Added the ETABLE X command. Data from a text file (fore and aft node values) can be plotted on elements.

ETABLE Utility – Added the ability to process stress ranges from the FATIG2 module. Enables stress ranges from a number of load cases to be plotted using the ETABLE command.

URSort - Corrected an existing formatting error. Result cases in list limited to 3 digits.

FS2000 GUI - Result cases can be scanned to produce animated plots - Useful for visualising dynamic time history solutions.

FS2000-GUI Report Collator – Print list now submits print list to printer as one file. This enables all output to be included in one PDF file when using a PDF writer.

MOUT6 – Added error trap to detect changes in model size (a potential user mistake when using Dynamic Interpretation)

FS-Pipe – Updated F101 checks to 2013 Edition. An option to undertake clause F200 ASD bend checks is now included.

Modal Response Analysis – Corrected a plotting error when a frequency response plot had more than two response locations.

FS2000 Distribution IN015 – Release Notes 1/4/2014

FS2000 GUI Version No 8.2.117

FS-DyNoFlex – Removed the requirement in include prescribed displacements (PDs) in all load cases in a time history solution. The first case in combination defines the freedoms with PDs. PDs can be included in other case if the displacement variation requires such.

3-D Non-Linear - Removed the requirement in include prescribed displacements(PDs) as above.

FS2000 Distribution IN014 – Release Notes 17/2/2014

FS2000 GUI Version No 8.1.117

Eigen Frequency Solution – Eigenvectors displacements listing text file added, <modelname>.O.FREQ(n) . Type 50 shell elements now included.

AISC 360 - De-rating factor added, enables a Ks type factor to be applied (See ISO 19902-3) Corrected minor axis. limit when using US units(formatting error URs correct). Clause H6-3 - For CHS section the moment and direct shear contributions are based on the resultants (previously the CHS and boxes used the same approach – see Help file). Corrected error in Clause F10.3 (Angle Lateral Torsion Buckling Mn value too high)

AISC/API - Added torsional components listing. UR now shows resultant direct shear utilisation.

FS2000 GUI, OUT6 & MOUT6 - Change torsion contribution to VM stresses for pipe sections. Was $(T^2+Sy^2+Sz^2)^{0.5}$ now $T+(Sy^2+Sz^2)^{0.5}$. This will produce slightly more conservative results and be in line with some pipeline codes(older DNV and PD8010) ie max bending and max direct shear are assumed coexistent . Use VM48 to show effect of true shear distribution.

FS2000 GUI - Beam Stress inspection also shows VM48 stresses where circumferential shear stress distribution is accounted for (evaluated at 48 stress points).

FS-Pipe – Corrected Error – Mid span checks on first element to be checked were incorrect (output displayed incorrect span locations -Nodal values were correct). Added 2012 B31.3 Appendix P alternative rules.

Eigen Buckling Solution - New Capability. For beams and Type 50 shells (Plate action)

DyNoFlex/3D-Non-linear – Added P-Delta (Geometric Stiffness/Non-linear buckling) to Type 50 shell in the form of Type 53 Shells.

Batch Process Module – Added speed option for interpreting command lines

FS-EC3 Added the option for user defined Mcr (Lateral buckling)

FS-DyNoFlex & 3-D Non-linear - Added user define variable soft spring option.

FS2000 Distribution IN013 – Release Notes 28/10/2013

FS2000 GUI Version No 8.1.116

ETable Batch Utility Added – Creates stress and strain output listings and plot data for when using Type 6 pipe elements (Type 6 and Type 7 plasticity).

Plastic stress and strain plots for plastic pipe for Table command in GIU plot menu (requires ETable to first create the data)

Error Correction GUI crashes when accessing 3D-Nonlinear options data from older models.

FS2000 Distribution IN012A – Release Notes 16/10/2013

FS2000 GUI Version No 8.3.115

Fatigue Analysis – Solid element fatigue life evaluation now included (Deterministic only).

3-D Non-linear- Added Type 50 shell elements (3 & 4 node – Soln Opt 0 & 3)

FS-DyNoflex- Added Type 50 shell elements (3 & 4 node – Soln Opt 0 & 3)

New - Type 16 Couple - Node to Boundary surface

FS2000 GUI - Shell frequency mode shape plots (DyNoFlex Frequency output only)

FS2000 GUI - Added set scroll buttons to Result SET form for easier editing

FS-Pile - More than 10 piles can be created

DyNoFlex-Fixed restraints bug when plotting time history animations

JointCheck-Fixed JCH command bug fixed now active for all codes not just EC3

PipeProp-Increased number of temperature profile to 20 (for pipe walking analysis)

FS2000 GUI – Warning given if Windows (regional settings) uses the comma for decimal point

Maintain USD designation when interpreting non- standard pipe properties

FS2000 GUI – Added Von-Mises beam line plots

FS2000 GUI – Added Von-Mises beam contours plots

FS2000 GUI – Added beam stress contours plots

FS2000 GUI – Added beam UR contours plots

FS2000 GUI – Plots node and element labels on displaced geometry

FS2000 GUI – Can pick (query) nodes (& centre of rotation) and elements on displaced geometry

FS-Graph – Help file added

Tutorials – Basic operation of DyNoFlex
Tutorials – Pipewalking analysis
Tutorials – UHB analysis