

# NASGRO v9.11 Additions, Changes and Fixes by NASGRO Module

24-Aug-20

Category	Applicable NASGRO Module									Description	
	NASGRO Main	Config Control	NASFLA	NASSIF	NASCCS	NASGLS	NASMAT	NASBEM	NASFORM		Users Manual
Change			X	X	X	X					The file selection dialogs will now default to the most recently selected file directory.
Fix			X								When comparing two material IDs under unit system M3, the thickness value is not being converted to meters.
Fix			X								Internal code that correctly clears a given tabular grid of data was also incorrectly clearing the column header labels "R, da/dN, dK." These grid cells should be ignored by the reset code.
Fix			X								Due to an internal logic error in the code, a user material data record containing category "E" was not being properly read, causing it to go missing from the material selection list dialog, preventing the material from being able to be selected for use in an analysis.
Fix				X							When specifying normalization names for on the OutputOptions tab, a malformed batchfile was created blocking successful computation and plotting.
Fix				X							Crack case CC12: When plotting for 2D correction factors, the y-axis is not always labeled with the correct stress quantity.
Fix			X								On the 'Load Blocks' tab, when "input cycles and stresses manually" is selected for block type, inserting or deleting rows from the stress grid would not appear to function initially, but the change would not be saved when switching blocks.
Fix					X						NASCCS won't switch to secondary iteration scheme and stop with error. A check on existence of binary output database was found falsely terminating the computation when the secondary iteration scheme kicked in.
Fix			X	X							Crack case DT04, KT04, TC33: For DT04 and KT04, the crack tips on the 'Output Options' tab were incorrectly labeled 'a' and 'c' instead of 'c' and 'c1'. Further, on NASFLA, when "crack growth interval" is selected, the "print according to" radiobox was also erroneously labeled 'a' and 'c' instead of 'c' and 'c1'.
Fix			X	X	X						Discrepancy in EC05 SIFs for identical stress scenarios using polynomial stress option and tabular applied stress option with residual stress option. The pitfall was found from inconsistent conversion for polynomial residual stress gradient, where incorrect origin was referred.
Fix				X							Output of offset TC24 correction factors not printed correctly. The values were found exceeding the definition of output format. The internal format was revised to have more flexibility to deal with extreme numbers.
Fix			X	X							Incorrect call to TC24/TC14 SIF modules for point spacing in connection to displacement gradients. The internal argument to designate the type of OPS for displacement gradients when calling TC24/TC14 SIF modules was found inconsistent. The discrepancy was identified and corrected during the API development.
Fix			X	X	X	X					Crack case TC12: An internal coding error caused an additional stress quantity S1 to be valid for this crack case, when it should only contain S0 and S2.
Fix				X							Converted coordinates with residual stress gradient for TC30/CC23 were not consistent with those for computed stress gradient from pin load. The inconsistency was found during the coordinate conversion for residual stress. The revision resolves such an error encountered during conversion.
Fix				X							Crack case SC04: The "S0 from internal pressures" checkbox was not correctly checking that "Stress Intensity Factors" was selected on the Output Options tab before displaying the S0 text control on the Output Options tab.
Fix			X	X							Error encountered during unloading memory with SC32 crack model subjected to residual stress. The specific statement for such memory unloading had been revised to resolve the error.
Fix			X	X							Computation for SIFs with SC32 crack model subjected to residual stress crashed without result. It was found the support for residual stress, monotonic shakedown, and cyclic shakedown with SC32 was not implemented. The revision included such new implementation.
Fix			X								Inconsistency found from cyclic shakedown with SC32 crack model where all Kmax=0. The pitfall is similar to bug #2685 where the support for residual stress, monotonic shakedown and cyclic shakedown was not implemented.
Fix				X							When database files for CC17 were missing with long working file path, the program crashed. This bug was only observed when the batch mode computational approach was invoked. The standard approach deployed from NASGRO GUI won't reproduce such an error. A revision had been implemented to properly terminate the computation with a full disclosure of the long working file path, instead of crashing the code.
Fix			X								When working with Walker equation data on the Material tab, the a0 value was not being saved to the input file, and would thus always load as the default value of '0.0015'.
Fix			X	X	X	X					The pop-up dialog show when selecting "Help->About" from the main GUI menu was not properly displaying the installation directory.

# NASGRO v9.11 Additions, Changes and Fixes by NASGRO Module

24-Aug-20

Category	Applicable NASGRO Module								Description		
	NASGRO Main	Config Control	NASFLA	NASSIF	NASCCS	NASGLS	NASMAT	NASBEM		NASFORM	Users Manual
Fix				X							Crack case TC16: The S0 stress definition was not being displayed or written when 'Correction Factors' was selected on the Output Options tab under the 'Chen + Schijve' bulge factor. It was also not written to the batchfile, causing an error when computation was attempted.
Fix				X							Error encountered even when d/L ratio was within TC16 validity limits. Two errors were identified: (a) tolerance issue and (b) no statements to scan S0 value in SIFBAT files implemented in DLLs. The revision resolved these two issues.
Fix			X	X							Inconsistency in stress gradients along crack plane from pin load for CC08 crack at short and long ligaments with the hole nearly at the center. The pitfall was found from a previous Fix (#2269) that would alter the result for crack at the long ligament due to not invoking the normalization factor. The revision thus generated consistent results.
Fix			X								When attempting to plot 1D da/dN tabular material data, faulty table validation code incorrectly issued an error message indicating the table data was not in required descending order, when it actually was.
Fix			X	X							Program to generate detailed stress files to support GUI plotting did not pick up inconsistency in user-provided stress pairs. The DLLs correctly picked up the error and prevented the computation to proceed. However, the program to generate more refined stress files to support GUI plotting was not up-to-date to identify the inconsistency in user-provided stress files.
Fix				X	X						The stress scale factor controls were defaulting to blank entries instead of '0' when selecting a crack case.
Fix			X	X	X	X					GUI menu options, such as units type and the last input file load directory, were not always being correctly saved to the GUI options file. This led to the GUI resetting to the default settings irregularly.
Fix			X								Crack case SC09: Several of the geometry checks were not being performed before computation was started, allowing inputs that were outside of the geometric bounds of the crack case to be used.
Fix			X	X							Anomalous TC34 SIF variations as both cracks grew deeper. Three issues were identified and fixed. Respectively they were (1) the finite width plate correction in AFRL report was revised to remove the kink, (2) the check for solutions limits now included a tolerance 0.0001, and (3) the inconsistent implementation in reference to the offset was corrected.
Fix			X								On the 'Load Blocks' tab, when selecting 'blocks represent flight hours', the flight hours text control was not being properly saved and updated for each block, instead being duplicated across all blocks.
Fix			X	X							Reference solutions for CC10 was updated to be consistent with those for CC08.
Fix			X								When attempting to plot multi-temperature user material files, the GUI would crash when the name of one or both of the materials was shorter than 8 characters.
Fix			X								Negative K from secondary stresses not being excluded in the determination of Kr value. This bug was identified when comparing results between v9.1 (with API 579 2007) and v9.2a (with API 579 2016).
Fix			X								Multiple temperature material file with load interaction model GW not working due to discrepancy in batch file format. The minute difference in file format for the usage of single temperature and multiple temperatures lead to this discrepancy. The revision in this release resolved this issue.
Fix			X								EC05 crack in compressive region failed the consistency check in FAD; i.e., different Lr values. The revision had been implemented to ensure the consistency.
Fix			X								A program crash occurred in the NASFLA GUI after an analysis was run, when selecting "sched/blk/step #". This was due to the code using an internal buffer that was too short to contain the long line of input data being read from the OUT2 file. This internal buffer has been expanded.
Fix			X								Fixed an error in calculation of the number of cycles to user-specified crack size for crack case TC37
Fix			X	X	X						Corrected a typo in the output of the unit system M3 in the output file
Fix			X	X	X						Crack Case SC26: Corrected upper limit for d/r in GUI geometry tab to be 24.
Fix			X	X							Incorrect stress label for second stress subjected to remote tension and in-plane bend with SC26 crack model. The label was revised in consistency with the remote bend.
Fix				X							Plotting SC26 SIF variations seemed having the a-tip and c-tip results reverse. The routines to support GUI plotting had been revised to resolve this tip-swapping issue.
Fix			X								Crack case SC30: Frequently used schedule files were incorrectly saving SC30 schedules as SC17, and SC31 schedules as SC19 (their internal code designations), which caused file read issues. Changes have been made to retain the true crack case names in the schedule files.

# NASGRO v9.11 Additions, Changes and Fixes by NASGRO Module

24-Aug-20

Category	Applicable NASGRO Module									Description	
	NASGRO Main	Config Control	NASFLA	NASSIF	NASCCS	NASGLS	NASMAT	NASBEM	NASFORM		User's Manual
Fix			X								Error displayed when plotting tabular betas (DT03). An un-initiated flag relating to tension/compression feature was identified to be the culprit that crashed the program. This issue was resolved once the revision was applied.
Fix			X								Indirect mode for initial crack size computation not working for SC05 when secondary stress was accounted for. The culprit was from the two invalid checks in the iteration routines. Once removed, the program runs to completion.
Fix			X								Discrepancies found in number of predicted life cycles with CC17 using v8.11 and v9.0. The root cause was from different tolerances defined in the driver and the SIF routine for CC17. The driver had a tolerance embedded while the SIF routine did not. So in very rare scenarios the driver allowed the computation to proceed while SIF routine sent back an error code not caught to terminate the computation. This discrepancy had been resolved in this release for consistency.
Fix			X	X							Crack depth ratio c/W at exact 0.9 using TC28 leading to violating the solution limits. Slight increase of the embedded tolerance with this crack model resolved this invalid error.
Fix			X	X							Crack cases DT03, KT03: Due to an incorrect internal variable assignment for crack tips, when loading an input file, table data on the GeomTables tab would display a-tip data when "show tables for: c-tip" was selected, and c-tip data when "Show tables for: a-tip" was selected.
Fix			X								Issue with flat load step check and associated error messages. More informative error message is provided when flat load step was encountered, instead of just a general/nonspecific error message, resulting in the termination of computation.
Fix				X							Misaligned tabular columns when geometry limits had been violated in TC34 NASSIF analysis. Output format for tabular columns when error was encountered had been revised to resolve this issue.
Fix			X								When selecting "Beta Factor, F" as the details to show on the Computations tab, the column labels were not over the correct columns.
Fix			X								When NASGRO equation multi-temperature materials were selected, the 'Load Blocks' tab was incorrectly enabling the unsupported options for 'Generate standard long block' and 'Generate acceptance vibration block'.
Fix			X								SC27 NASFLA analysis crashed the program with Fortran run-time error. Function call for adjustment derived from SC30 SIF routine contained inconsistent parameters. The revision generated results consistent with those from v8.21.
Fix			X	X							NASSIF analysis with geometric dimensions within TC13 solution limits not working. The error check for solution limits in parser was not updated accordingly to reflect the extension of the limits. The error occurred when the TC13 hole was placed at extreme offset from the plate center.
Fix			X								Fixed a problem in NASFLA -- the fatigue life computation can get stuck for some extreme cases if the applied stress intensity factors are near the fatigue crack growth threshold
Fix			X	X	X						Stress gradient OPS plotting problem with SC31. OPS routines to support GUI plotting were updated to be capable of handling much larger amount of stress points.
Fix				X							Result from NASSIF analysis with SC10 crack model showing all zero values. The error was resulting from incorrect assignment of computed SIF results.
Fix				X							Computed SIFs from NASSIF module with SC18 not shown in GUT's Output Windows. Examining the OUT1 file revealed the stress labels were missing causing GUI parser not to function correctly. Replacing them with correct labels resolved this data parsing error.
Fix			X	X							Crack case SC18: Plotting of SIF solution was not working due to an error in the scriptfile. Additionally, the GUI was attempting to plot all three tips, even for a symmetric case, resulting in no plot for the nonexistent tip.
Fix				X							Attempt to plot SIFs (correction factors) with TC24 crack type not generating any output. Several bugs were generated to resolve this, which required revisions in both GUI and DLLs to ensure consistency in data formats used by both ends.
Fix				X							Crack Cases TC11, TC24, TC33: The Output Options tab inadvertently enabled tip choices that were not applicable.
Fix				X							Crack Case CC08: Incorrect solution limits for the long ligament were shown on the bitmap and used in GUI error checking before computation.
Fix			X								Multiple temperature NASFLA crack growth analysis terminated with an error. The scenario occurred at high R ratios when internal routines tried to populate the table. An inconsistency check was caught when comparing Kmax against Kc provided in material tables, and the computation stopped. A revision was deployed when such incident was encountered where no further tabulation was generated and just assigned da/dN=0 if DK at Kc on account of high R is less than DKth.
Fix			X	X	X						Crack Case CC11: Some valid geometries would trigger the error message "a/t cannot be negative or greater than 0.95" and prevent computation.

# NASGRO v9.11 Additions, Changes and Fixes by NASGRO Module

24-Aug-20

Category	Applicable NASGRO Module								Description		
	NASGRO Main	Config Control	NASFLA	NASSIF	NASCCS	NASGLS	NASMAT	NASBEM		NASFORM	User's Manual
Fix			X								Incorrect number of cracks shown in output for SC12 specified with two symmetric cracks. The inconsistency was found due to incorrect use of API function call.
Fix			X								Crack case TC17: The limit "c/(W-d-r) cannot exceed 0.9" was not being properly validated, leading to the GUI rejecting some valid geometries.
Fix							X				NASMAT was unable to properly fit and plot data when utilizing both NASA and user data simultaneously.
Fix									X		Appendix R title was corrected in the manual Table of Contents.
Fix			X								The error checking routines that confirm there are no missing entries in the Parameter Analysis grid prior to running returned errors, even though no actual errors in the data were present, which prevented the entire group of analyses from running
Fix			X								Failed consistency check for crack transition from SC30 to TC12 based on two types of bending stress definition. The issue resulted from a disabled remote stress flag during crack transition, causing incorrect stress indexing when combining SCFs with SIFs.
Fix			X								2D Tabular da/dN data was being deleted from usrtbc.xml when saving new 1D or 2D user data to file. Further, using "different da/dN for each R" format was not saving correctly and would cause further overwrites of previously existing 2D da/dN data. This is an extension of the 9.2b fix.
Fix			X								Error encountered when running CC16 NASFLA analysis with user-specified tip classes. An inconsistency was identified with the number of tip classes between pre-API and post-API interfaces.
Fix			X								Setting the Kr value of the last point in FAL to zero. The Kr value with the last point of all FALs with Newman's TPFC, FITNET FALs and ASME/API FALs is assigned zero value in connection with the valid range of Lr.
Fix			X								Removal of an erroneous message shown at the first line in old OUT1 files generated from NASFLA. This message did not appear in the new OUT1 files.
Fix			X								When selecting multiple blocks on the "Load Blocks" tab, the "Block Summary Grid" on the "Build Schedule tab" would occasionally leave blocks empty when "manual" was selected as the block type.
Fix				X							Inclusion of a note to indicate a definition of "pseudo" crack depth is used for normalization factor in CC12 correction factors.
Fix				X							Crack case SC30: A problem with the internal symmetric flag caused NASSIF plotting to erroneously attempt to plot data for a third tip, c1.
Fix			X								Truncated material table output for da/dN vs R in OUT1 files. This issue does not show up in the old OUT1 files. The output statements have been revised to account for the increasing number of R ratios in material files.
Fix			X	X	X						Crack case CC16: Added the following GUI validation of geometric input: "0 < B < W-(D-2)".
Fix			X								CC12 SIF fluctuating in NASFLA computation in connection to out-of-plane bending stress. The root cause was from the definition of correction factor used to determine CC12 SIF where a small numerator could result in numerical instability. To resolve this, an alternative approach was deployed at this numerically unstable region.
Fix			X								When "elastic plastic" is selected, the "Cycles" column on the "Input cycles and stresses manually" grid on the "Load Blocks" tab was filled with checkboxes, would not allow the ability to enter the number of cycles.
Fix			X								Computation for CC11 NASFLA analysis invoking shakedown terminated with error message. An inconsistency was found when retrieving binary data information during shakedown computation. Once the issued is fixed the computation runs to completion.
Fix			X								Computation for SC26 NASFLA analysis with long block terminated right after transitioning into TC17. The notch designation for an elliptical notch or a straight-edge notch was not passed to the TC17 routine once crack transitions. The same analysis from some other NASGRO versions may work because of such un-initialization. The update ensures the notch designation is passed correctly once crack transition is invoked.
Fix			X								NASFLA computation for SC26 with long block and shakedown enabled terminated with no specific error message in SCREEN.OUT. Using v9.2b, the program runs fine. The revision back-ported the memory allocation module for v9.2 to v9.1 to resolve this issue.
Fix			X	X	X						Computation for CC08 NASSIF with negative S2 hung without further response. The combined load being negative or equal to zero was the pitfall to hold the computation indefinitely when determining the crack initiation angle. The revision allows the computation to keep going if the pin load is zero with the assumption that the crack initiation angle is zero.
Fix			X	X							Crack case CC08: The expressions for the limits on the crack size c have been adjusted in the bitmaps in the crack in long ligament option to reflect that the crack size is normalized with respect to "B-D/2", instead of "W-B-D/2". The GUI code that checks the geometry input values has also been adjusted accordingly.

# NASGRO v9.11 Additions, Changes and Fixes by NASGRO Module

24-Aug-20

Category	Applicable NASGRO Module								Description		
	NASGRO Main	Config Control	NASFLA	NASSIF	NASCCS	NASGLS	NASMAT	NASBEM		NASFORM	Users Manual
Fix			X	X							No error issued for geometric dimensions exceeding the CC08 solution limits. This bug on the DLLs side was uncovered because GUI's check on this was also inconsistent. This revision was focused on the limits for crack at the long ligament.
Fix			X		X						Fixed a bug in setting the maximum allowed crack size for CC16, which can impact NASCCS calculation and NASFLA inverse calculation of initial flaw size
Fix			X	X							After an input file was loaded, for SIF Compounding, the number of defined SIF compounding tables per stress quantity/tip was always showing on-screen as one, regardless of the true number of defined tables.
Fix			X								When attempting to plot 'Beta factor' on the computations tab, crack cases with both a 'c' and an 'a' tip would not generate a plot
Fix			X								NASFLA using alternative bivariant stress file not working with inconsistent GUI pop-up error. This erroneous scenario occurred when shakedown was enabled while alternative bivariant stress file was also used. The GUI error indicating "residual stress file named is not specified" was incorrectly generated. If shakedown was not invoked, no GUI error would occur.
Fix			X								When running SC29 using the 'alternative 2D stress input' option, the stress file validation check was incorrectly calculating the maximum X value, and thus blocking computation.