

April 11, 1994
G-1151-RSO-94-099

Document Control Desk
United States Nuclear Regulatory Commission
Washington, D.C. 20555

BOEING

Reference: a) Boeing Letter G-1551-RSO-365 dated August 31, 1992;
R. S. Orr to the NRC Operations Center

b) NRC Letter Docket No. 99901227 dated August 12,
1992; L. J. Norrholm to R. S. Orr; Subject: Response to
10 CFR 21 Inquiry

Dear Sir or Madam:

In accordance with the reference correspondence and 10 CFR 21, Boeing is sending the NRC the attached error notice(s) received from our former software suppliers. Because of unknown current addresses, the following former customers were not notified:

Reactor Controls, Inc.

Echo Energy Consultants, Inc.

Nuclear Applications and Systems Analysis Company (Japan)

Nuclear Power Services

Error notices have been sent to our other former customers.

Very truly yours,

J. Francalancia / for

R. S. Orr
Nuclear Administrator
G-1151 M/S 7A-33
(206) 865-6248

Attachment(s): ANSYS Class 3 Error Reports 94-10, 94-11, 94-12
94-13, ANSYS QA Notice QA94-02

JE20

ANSYS® CLASS3 ERROR REPORT

ERROR NO: 94-10

KEYWORDS: TRANSIENT PREDICTOR LINE SEARCH

DESCRIPTION OF ERROR:

A transient analysis (ANTYPE,TRANS or TIMINT,ON) may be incorrect under the following conditions:

1. predictor is active (PRED,ON);
- and 2. line search is active (LNSRCH,ON);
- and 3. a non-zero specified degree of freedom (D command) is applied during one load step and that same degree of freedom was either ramped during the previous step or it was free (not specified).

The solution is incorrect if the degree of freedom solution value does not match the specified value.

FIRST INCORRECT VERSION(S):*

Rev. 5.0
ANSYS/Emag Rev. 5.0A

CORRECTED IN:*

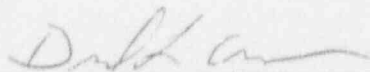
Rev. 5.1
ANSYS/Emag Rev. 5.1

SUGGESTED USER ACTION FOR RUNNING ON UNCORRECTED VERSION:

COMMENTS:

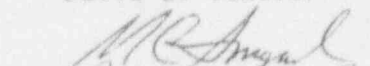
For the error to occur, all of the line search parameters must be less than one during a substep that has the predictor active.

AUTHOR/CORRECTOR:


David L. Conover

DATE: March 25, 1994

REVIEWED BY QA:


Mark C. Imgrund

DATE: March 25, 1994

APPROVAL:


John A. Swanson

DATE: March 25, 1994

*If a product name is not included in the "first incorrect version", the full ANSYS program is implied. For products not listed, this error does not apply, but see the reverse side for equivalent product designations.

Unless noted otherwise, this error report also applies to all revisions after the first incorrect one and prior to the corrected revision. All revisions after "corrected in" are corrected. Manual corrections are included in on-line documentation as appropriate. Please see the reverse side of this sheet for additional information on ANSYS revision identifiers.

FORM SASI-QA25
DEC 19, 1988

ANSYS® CLASS3 ERROR REPORT

ERROR NO: 94-11

KEYWORDS: PSTRES,ON STRESS STIFFENING

DESCRIPTION OF ERROR:

Analyses with prestressing effects to be calculated (PSTRES,ON) will include these stress-stiffening effects in the solution regardless of the setting of the SSTIF command. The solutions obtained are the same as those obtained with stress-stiffening effects included (SSTIF,ON).

If there are no nonlinearities present and multiple iterations are done, the solution will not necessarily be converged since no equilibrium iterations are performed.

FIRST INCORRECT VERSION(S):*

Rev. 5.0
ANSYS/LinearPlus Rev. 5.0A

CORRECTED IN:*

Rev. 5.1
ANSYS/LinearPlus Rev. 5.1

SUGGESTED USER ACTION FOR RUNNING ON UNCORRECTED VERSION:

If no nonlinearities are present, use NROPT,FULL to trigger convergence checking. For ANSYS/LinearPlus, add a contact element type (ET command, CONTAC12 or CONTAC52) to your input.

COMMENTS:

For single iteration (linear) analyses, there are no stress-stiffening effects unless an initial prestrain was input in the element real constants (line elements LINK1, 8, and 10, beam elements BEAM3, 4, 44 and 54, and PIPE59 only).

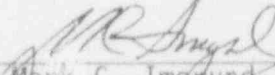
Multiple iterations may be user-defined (multiple load steps and/or substeps) or they may automatically be triggered if a nonlinearity is present.

AUTHOR/CORRECTOR:


David L. Conover

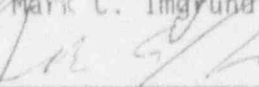
DATE: March 25, 1994

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FORM SASI-QA25
DEC 19, 1988

ANSYS® CLASS3 ERROR REPORT

ERROR NO: 94-12

KEYWORDS: SOLUTION MULTI-FIELD REDUCED

DESCRIPTION OF ERROR:

In a multi-field (e.g. UX, UY, and VOLT degrees of freedom) reduced analysis (e.g., MODOPT, REDUC) with scalar master DOF's specified (e.g., VOLT), Guyan reduction of the mass and damping matrices is not valid, as structural entities are moved to the scalar degrees of freedom (e.g. mass to "VOLT"). The results of such an analysis will be incorrect.

FIRST INCORRECT VERSION(S):*

Rev. 4.0

CORRECTED IN:*

Rev. 5.1

SUGGESTED USER ACTION FOR RUNNING ON UNCORRECTED VERSION:

Use a "full" analysis path instead of "reduced" analysis, or run the "reduced" analysis with only structural master DOF's.

COMMENTS:

The error conditions are typical of piezoelectric analyses, and will occur if VOLT masters are specified, or program chosen (TOTAL command with the NRMDF parameter set to 0).

The error is also typical of acoustic fluid-structure analysis, in which the PRES degree of freedom is mixed with structural DOF's.

Rev. 5.1 will prevent solution of a problem with mixed structural and non-structural master degrees of freedom.

AUTHOR/CORRECTOR:


Cecil R. Rogers

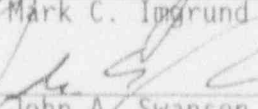
DATE: March 25, 1994

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FORM SASI-QA25
DEC 19, 1988

ANSYS® CLASS3 ERROR REPORT

ERROR NO: 94-13

KEYWORDS: VISCO ELEM106 ELEM107 ELEM108

DESCRIPTION OF ERROR:

In a large deflection analysis (NLGEOM,ON), the coordinate systems used to store and display the results for the VISCO106, VISCO107, and VISCO108 elements are rotated by the amount of rigid body rotation of the element. The User's Manual (Procedures and Elements volumes) incorrectly implies that this rotation effect is not included for these elements.

FIRST INCORRECT VERSION(S):*

Rev. 5.0

CORRECTED IN:*

Rev. 5.0 Procedures and Elements
Manuals, Upd0, Printing 5

SUGGESTED USER ACTION FOR RUNNING ON UNCORRECTED VERSION:

COMMENTS:

1. For all elements, the Solution phase writes (to the results file) or lists (to the output file or device) results in the element coordinate system. If large deflections are turned on (NLGEOM,ON) and the element has large deflection capability, this element coordinate system is first rotated by the amount of rigid body rotation of the element. The only large deflection elements for which this element coordinate system rotation is not done are HYPER56, 58, 74, 84, and 86.

In POST1, any results coordinate system (specified by the RSYS command) is additionally rotated by this same amount of rigid body rotation, element by element. The default RSYS is the global Cartesian system.

2. The Rev. 5.0 Nonlinearities User's Guide contains the same error.

AUTHOR/CORRECTOR:

Daniel D. Ketelaar
Daniel D. Ketelaar

DATE: March 25, 1994

REVIEWED BY QA:

Mark C. Imgrund
Mark C. Imgrund

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APPROVAL:

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FORM SASI-QA25
DEC 19, 1988

ANSYS QA NOTICE

NOTICE NO: QA94-02

SUBJECT: *ROTATED NODES* *THIN SHELLS*

DESCRIPTION:

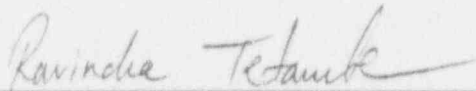
The numerical inaccuracy of the routine that performs nodal rotations is approximately $1.0\text{E-}6^\circ$ (for example, a nodal rotation value that theoretically should be exactly 30° might be computed as 30.000001°). This will generally introduce very minor numerical inaccuracies in most solutions using rotated nodes.

Its effect on solution accuracy is more pronounced and significant in an analysis using very thin shells with rotated nodes. Nodal coordinate systems should be left unrotated, if possible, when using very thin shells.

This computation has been improved to be accurate to within approximately $1.0\text{E-}10$ in Revision 5.1.

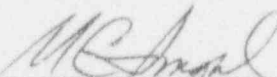
AFFECTED VERSIONS: Rev. 5.0, 5.0A and Component Products Rev. 5.0A

AUTHOR:


Ravindra Tetambe

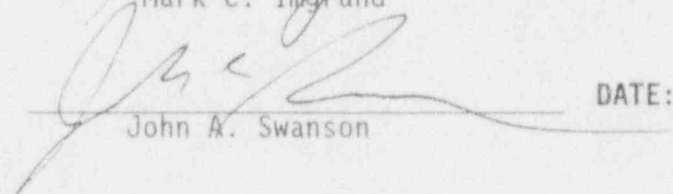
DATE: March 25, 1994

REVIEWED BY QA:


Mark C. Imgrund

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APPROVAL:


John A. Swanson

DATE: March 25, 1994

SASI-QA3
AUG. 29, 1993