82-735-000

united engineers & constructors inc.
30 South 17th Street
Post Office Box 8223
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BOSTON
DALLAS
ECHELON
KNOXVILLE
PHILADELPHIA
VALLEY FORGE

October 21, 1982

Director
Office of Inspection and Enforcement
U.S. Nuclear Regulatory Commission
Washington, DC 20555

Owen - Include in P.21 report resolution.

Dear Sir:

Subject: Results of the Evaluation Conducted as a Result of the 10CFR21 Report of a Potential Defect Related to Carolina Power & Light Company - Brunswick Station - Units 1 and 2

Bill

A 10CFR21 report of a potential defect was submitted to the NRC on August 17, 1982. The report described a condition found during transient analysis for the Mark I Torus program whereby a discrepancy existed between the orientation of a number of pipe support (snubber) details and their representation in the analysis of record. This discrepancy resulted in increased pipe stresses and support loads which, in some cases, exceeded the allowable limits. As a result of this finding, corrective action was taken as described in the attached report.

letter attached

The corrective action has been completed and those fixes necessary to insure the piping system structural adequacy have been designed and transmitted to CP&L for installation. Additional supports which experienced increased loads have been verified to be within structural integrity limits and not to effect the structural integrity of the associated piping systems. A schedule for the completion of the long term fix design and installation program is being developed in conjunction with CP&L and will be forwarded to the NRC by November 30, 1982. Additional details of the corrective action and the results of this action are contained in the attached report.

Very truly yours,

for G. E. Sarsten
Vice President - Power

Attachment

cc: Regional Director
USNRC - Region 1

Regional Director
USNRC - Region 2

Mark

IE 19

ATTACHMENT 1

Report of Corrective Action Taken in Response to the August 17, 1982 Report of a Potential Defect Related to Snubber Misorientation in the Brunswick Station Units 1 and 2 - Carolina Power and Light Company

Corrective Actions Taken

The scope of the corrective action taken to resolve this potential defect was expanded from that described in our original report (copy attached) to include all lines inside containment which were analyzed in accordance with IE Bulletins 79-07 and 79-14. In addition, the snubber and strut orientations used in this evaluation were reverified in the field prior to any analysis.

In total, 39 isometrics containing 317 snubbers and struts have been evaluated for each unit. This represents 100% of the unidirectional supports on safety related lines inside containment. The orientation of all unidirectional supports was reviewed for each isometric and if any strut or snubber was outside the accepted tolerance, the isometric was reanalyzed incorporating all deviations, thereby resulting in a complete reanalysis of all deviations in both Brunswick Units.

The corrective actions 1 through 4 as described in the original report have been completed. Item 5 has been completed to the extent that all support modifications necessary to insure piping system structural integrity have been designed and transmitted to CP&L for installation. A list of these supports is provided in Table 1. The remaining supports which experienced increased loads, due to reanalysis, have been verified to be within structural adequacy of the associated piping systems. A list of these supports by isometric data point and type is provided in Table 2. A schedule for the final review of these supports and the design of any necessary modifications is being developed in conjunction with CP&L and will be forwarded to the NRC by November 30, 1982.

TABLE 1

LIST OF FIXES SENT TO CP&L

UNIT - 2	Main Steam 14 - 237(Y)		2 PSN-A3SS33
UNIT - 2	Main Steam 14A- 230(Y)		2 PSN-A3SS34
UNIT - 1	Main Steam 14A- 230(Y)		1 PSN-D3SS72
UNIT - 1	Safety Relief Valve Discharge	127 - 58 (New Guide)	PS-6647

TABLE 2

LIST OF SUPPORTS WITH LOAD INCREASES

BSEP - UNITS 1 AND 2

	UNIT - 1			UNIT - 2		
SYSTEM	ISO	DATA POINT	SUPPORT TYPE	ISO	DATA POINT	SUPPORT TYPE
RHR	5 LOOP A	18	S (Y)	5 LOOP(A)		
		19	S (Y)		19	S (Y)
RHR	5 LOOP B	18	S (Y)	5 LOOP B		
		19	S (Y)		19	S (Y)
RHR	6	13	S (SKEW)	6	None	
		133	S (SKEW)			
		232	S (SKEW)			-
NSS	8	177	S (Z)	8	303	S (1)
		106	G (Z)		302	S (X)
		301	S (Z)		177	S (Z)
		171	S (Y)		175	S (X)
		169	G (X)		106	G (Z)
		406	G (X)		301	S (Z)
		406	G (Z)		406	G (X)
		411	G (X)		169	G (X)
		411	G (Z)		411	G (Z)
		157	G (Z)		157	G (Z)
		302	S (X)		205	G (Z)
		205	G (Z)		275	S (X)
		275	S (X)		276	S (Y)
		276	S (Y)		400	S (Z)
		400	S (Z)		261	G (X)
		261	G (X)			

	UNIT - 1			UNIT - 2		
SYSTEM	ISO	DATA POINT	SUPPORT TYPE	ISO	DATA POINT	SUPPORT TYPE
M.S.	14	5	PENET. X-7A	14	216	S (Z)
		105	PENET. X-11		230	S (Y)
		66	REAC. NOZ. N-3A		237	S (Y)
		216	S (Z)		140	S (X)
					140	S (Y)
		230(3230)	S (Y)		121	S (Z)
		230(2010)	S (Z)		320	S (Z)
		237	S (Z)		255	S (Z)
		237	S (Y)		255	S (X)
		140	S (X)		116	S (X)
		140	S (Y)			
		116	S (X)			
		255	S (X)			
		255	S (Z)			
SRV	124	1110	ANCHOR	124	1029	S (Y)
		1029	S (Y)		1037	S (Z)
		1038	S (X)		1045	S (Y)
		1037	S (Z)		1057	S (Z)
		1057	S (Z)		1073	S (X)
		1073	S (X)		1075	S (Y)
		1075	S (Y)			
SRV	126	2073	S (X)	126	2010	S (X)
		2075	G (Y)		2041	S (Z)
		2103	S (⊥)		2042	S (Y)
					2044	S (X)
					2050	S (Y)
					2073	S (X)
					2075	G (Y)

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	UNIT - 1			UNIT - 2		
SYSTEM	ISO	DATA POINT	SUPPORT TYPE	ISO	DATA POINT	SUPPORT TYPE
M.S.	14A	216	S (Z)	14A	5	PENET. ANCHOR
		230	S (X)		600	REACT. NOZ.
		230	S (Y)		216	S (Z)
		237	S (Y)		230	S (X)
		255	S (Z)		230	S (Y)
					237	S (Y)
					255	S (X)
					255	S (Z)
					237	S (Z)
SRV	119	2146	S (Y)	119	2068	S (Y)
		2244	S (X)		2068	S (Z)
		2344	S (Z)		701	S (Z)
		2238	S (Y)		2125	S (X)
		701	S (Z)		2146	S (Y)
					2244	S (X)
					2344	S (Z)
					2238	S (Y)
					2234	S (1)
SRV	127	58	G (1)	127	60	S (X)
		60	S (X)		437	S (X)
		438	S (Z)		438	S (Z)
		1388	S (X)		1388	S (X)
		377	S (Y)		1388	S (Z)
					377	S (X)
					377	S (Y)
					1755	S (Z)

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	UNIT - 1			UNIT - 2		
SYSTEM	ISO	DATA POINT	SUPPORT TYPE	ISO	DATA POINT	SUPPORT TYPE
M.S.	15B	18	S (X)	15B	18	S (X)
		105	S (Y)		105	S (Y)
		60	S (Z)		71	S (Z)
		107	S (Y)		110	S (X)
		73	S (X)		110	S (Z)
SRV	121	3084	S (⊥)	121	3084	S (⊥)
		3067	S (X)		3067	S (X)
		3066	S (Z)		3066	S (Z)
		3048	S (X)			
		3048	S (Z)			
		3200	S (⊥)			
SRV	122	2062	S (Z)	122	2062	S (Z)
		2092	S (X)		2092	S (X)
		2094	S (Z)		2094	S (Z)
		2156	S (X)		2156	S (X)
		2235	S (⊥)			
SRV	125	1072	S (Z)	125	1072	S (Z)
		1065	G		1065	G (Y)
		1150	S (X)		1140	S (Y)
					1150	S (X)
					1150	S (Z)
SRV	237	466	S (X)	237	440	G (X)
		472	S (Z)		525	S (AXIAL.)
		484	S (X)			
		503	S (Y)			
		525	S (AXIAL.)			

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	UNIT - 1			UNIT - 2		
SYSTEM	ISO	DATA POINT	SUPPORT TYPE	ISO	DATA POINT	SUPPORT TYPE
M.S.	15C	61	S (Y)	15C	101	PENET. ANCHOR
		17	S (X)		5	REAC. NOZ.
		105	S (Y)		61	S (Y)
		309	S (X)		61	S (Z)
		71	S (Z)		17	S (X)
		107	S (Y)		105	S (Y)
		110	S (X)		71	S (Z)
		110	S (Z)		107	S (Y)
					110	S (X)
					110	S (Z)
SRV	120	926	S (Z)	120	762	S (Y)
		930	S (Y)		762	S (Z)
		855	S (Z)		768	S (X)
					930	S (Y)
					877	S (X)
					876	S (Z)
					855	S (Z)
SRV	123	396	S (Z)	123	396	S (Z)
		376	S (Y)		376	S (Z)
		365	S (X)		365	S (X)
					309	S (Z)
SRV	187	635	S (Z)	187	161	S (Y)
		640	S (Y)		176	S (Z)
		241	S (X)		191	S (X)
		198	S (Y)		241	S (X)
		193	S (Z)		241	S (Z)
		191	S (X)		635	S (Z)

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	UNIT - 1			UNIT - 2		
SYSTEM	ISO	DATA POINT	SUPPORT TYPE	ISO	DATA POINT	SUPPORT TYPE
		176	S (X)		640	S (Y)
		161	S (Y)			
FW	16(LOOP B)	24	S (X)	16(LOOP B)	806	S (X)
		718	S (Z)		103	S (PARALLEL)
		719	S (Y)		24	S (X)
		108	S (SKEW)		718	S (Z)
		722	S (X)		719	S (Y)
		726	S (Z)		108	S (SKEW)
		725	S (X)		722	S (X)
RCIC	21	405	S (Y)	21	401	S (X)
		410	S (Z)		405	S (Y)
		505	S (Y)		410	S (Z)
		1023	G (X)		505	S (Y)
		28	G (Y)		23	G (X)
		107	G (Y)		23	G (Z)
		107	G (X)		28	G (Y)
					107	PENET. GUIDE (Y)
					107	PENET. GUIDE(SKEW)
RHR	25	12	S (X)	25	12	S (X)
		22	G (X)		16	S (Z)
		46	S (X)		20	S (Z)
		46	S (Z)		22	G (X)
		68	S (Y)		46	S (Z)
		175	S (X)		56	S (Y)
		90	S (X)		68	S (Y)
		90	S (Y)		66	S (X)
		195	S (Z)		188	S (Y)

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	UNIT - 1			UNIT - 2		
SYSTEM	ISO	DATA POINT	SUPPORT TYPE	ISO	DATA POINT	SUPPORT TYPE
					175	S (X)
					90	S (X)
					195	S (X)
CRD	27	117	S (Z)	27	Line removed from unit 2.	
		110	G (Y)			
		110	G (⊥)			
		90	G (Y)			
		90	G (⊥)			
		75	G (X)			
		75	G (Y)			
		72	G (Z)			
		65	S (Y)			
		58	S (X)			
		55	S (Z)			
		45	S (⊥)			
		42	S (Y)			
		34	S (⊥)			
NSS	32	45	G (⊥)	32	45	G (⊥)
		55	S (X)		501	S (Y)
		502	S (Z)		55	S (Y)
		514	S (X)		502	S (Z)
		68	G (⊥)		514	S (X)
		508	S (Z)		68	G (⊥)
		167	G (⊥)		71	S (Y)
		506	S (Z)		508	S (Z)
		507	S (X)		167	G (⊥)
		510	S (AXIAL.)		506	S (Z)
					507	S (X)

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	UNIT - 1			UNIT - 2		
SYSTEM	ISO	DATA POINT	SUPPORT TYPE	ISO	DATA POINT	SUPPORT TYPE
RBCCW	78	463	G (Y)	78	463	G (Y)
		545	S (Z)		470	G (Y)
		4130	G (X)		545	S (Z)
		4135	G (X)		4130	G (X)
		4135	G (Y)		4135	G (X)
					4135	G (Y)
RBCCW	79	54	ROD (Y)	79	54	ROD (Y)
		154	S (X)		154	S (X)
		155	S (Z)		155	S (Z)
		45	G (1)		45	G (⊥)
		25	G (1)		25	G (⊥)
RBCCW	80	222	G (Z)	80	222	G (Z)
		232	ROD (Y)		287	G (X)
		287	G (X)		287	G (Y)
		287	G (Y)		277	S (Z)
		277	S (X)			
F.W.	160	806	S (X)	160	806	S (X)
		103	S (AXIAL.)		718	S (Z)
		24	S (X)		103	S (PARALLEL)
		901	S (Z)		24	S (X)
					108	S (⊥)
					726	S (Z)
C.S.	524 (South Loop)	136	S (Y)	24 (South Loop)	NONE	
		137	S (AXIAL)			
		151	S (Z)			
		151	S (X)			

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	UNIT - 1			UNIT - 2		
SYSTEM	ISO	DATA POINT	SUPPORT TYPE	ISO	DATA POINT	SUPPORT TYPE
C.S.	524 (North Loop)	136	S (Y)	24 (North Loop)	NONE	
		137	S (AXIAL.)			
		151	S (Z)			
		154	S			
NSS	706	32	G (X)	206	77	G (X)
		36	G (X)		77	G (Z)
		83	S (Y)		84	G (Z)
		91	G (Z)		92	G (Z)
		94	G (1)		193	G (Y)
		97	G (1)		97	G (Y)
					111	G (Y)
					114	G (Y)
					3460	G (Y)
					3480	G (Y)
					94	G (Y)
NSS	706A	405	G (1)	206A	365	G (X)
					365	G (Z)
					480	G (Y)
SLC	36	NONE		36	10	G (Y)
					51	G (X)
					495	S (X)
					490	S (Y)
RBCWW	81	NONE		81	265	S (Z)
					275	G (TRANS.)
					295	G (TRANS.)

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	UNIT - 1			UNIT - 2		
SYSTEM	ISO	DATA POINT	SUPPORT TYPE	ISO	DATA POINT	SUPPORT TYPE
NSS	87	NONE		87	10	PENET. GUIDE (X)
					217	G (Y)
					232	G (Y)
					317	G (Y)
					421	G (X)
					428	G (Y)
					428	G (Z)
NSS	128	NONE		128	440	G (Y)
					451	S (X)
					455	G (Y)
					470	G (X)
					513	S (⊥)
					538	S (X)
					650	G (Y)
					637	S (Y)

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30 South 17th Street
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BOSTON
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VALLEY FORGE

August 17, 1982

Director
Office of Inspection and Enforcement
U. S. Nuclear Regulatory Commission
Washington, DC 20555

Dear Sir:

Subject: 10CFR21 Report of a Potential Defect Related to Carolina Power and Light Company - Brunswick Station - Units 1 and 2

This confirms a telephone report of a potential 10CFR21 reported to the NRC at 11:01 a.m. on August 14, 1982. This report describes a condition found during analysis performed on a Main Steam and Attached Safety Relief Valve Discharge lines to incorporate transient loads developed from the Mark I Torus program. A review of the analysis input data indicated that a discrepancy existed in the orientation of a number of pipe support (snubbers) details and their representation in the analysis of record. This discrepancy resulted in pipe stress and support loads which did not jeopardize the structural adequacy of the piping system but exceeded the allowable limits.

Applicable details as required by 10CFR21, paragraph 21.21(b) (3) are contained in the attached report. This condition has been reported to Carolina Power and Light Company.

Very truly yours,

G. E. Sarsten

G. E. Sarsten
Vice President - Power

Attachment

copy: Regional Director
USNRC - Region 1

Regional Director
USNRC - Region 2

8208190177

NAME AND ADDRESS OF THE INDIVIDUAL OR INDIVIDUALS INFORMING THE COMMISSION

G. E. Sarsten, Vice President - Power
United Engineers & Constructors Inc.
30 South 17th Street
Philadelphia, Pa. 19101

IDENTIFICATION OF THE FACILITY, THE ACTIVITY, OR THE BASIC COMPONENT SUPPLIED FOR SUCH FACILITY OR SUCH ACTIVITY WITHIN THE UNITED STATES WHICH FAILS TO COMPLY OR CONTAINS A DEFECT

Brunswick Steam Electric Plant Units 1 and 2 of Carolina Power and Light Company

Stress in the Safety Relief Valve Discharge Line No. 124 and loads for the attached snubbers at data point Nos. 1073, 1037 and 1057. Pipe stress and snubber loads exceed the allowable limits although within structural integrity limits.

IDENTIFICATION OF THE FIRM CONSTRUCTING THE FACILITY OR SUPPLYING THE BASIC COMPONENT WHICH FAILS TO COMPLY OR CONTAINS A DEFECT

United Engineers & Constructors Inc., architect engineer

NATURE OF THE DEFECT OR FAILURE TO COMPLY AND THE SAFETY HAZARD WHICH IS CREATED OR COULD BE CREATED BY SUCH DEFECT OR FAILURE TO COMPLY

The orientation of a number of snubbers for the above mentioned main steam and attached safety relief valve discharge lines were found to deviate from the orientation considered for the pipe stress analysis. This deviation results in increased support loads and pipe stress when the proper orientation was accounted for in the pipe analysis. The corrected support loads and pipe stress level exceeded those permitted by the associated allowable limits; however, this condition was analyzed to not affect the structural integrity of the piping system.

THE DATE ON WHICH THE INFORMATION OF SUCH DEFECT OR FAILURE TO COMPLY WAS OBTAINED

August 12, 1982

IN THE CASE OF A BASIC COMPONENT WHICH CONTAINS A DEFECT OR FAILS TO COMPLY, THE NUMBER AND LOCATION OF ALL SUCH COMPONENTS IN USE AT, SUPPLIED FOR, OR BEING SUPPLIED FOR ONE OR MORE FACILITIES OR ACTIVITIES SUBJECT TO THE REGULATION IN THIS PART

This defect applies to only the Brunswick Steam Electric Plant Units 1 and 2.

THE CORRECTIVE ACTION WHICH HAS BEEN, IS BEING, OR WILL BE TAKEN:
THE NAME OF THE INDIVIDUAL OR ORGANIZATION RESPONSIBLE FOR THE ACTION: AND
THE LENGTH OF TIME THAT HAS BEEN OR WILL BE TAKEN TO COMPLETE THE ACTION

Corrective Actions

1. Have assured that the line and the snubbers subject of the reported deficiency were within limits which assure structural integrity.

2. Have evaluated the extent of the snubber misorientation conditions and identified the additional systems which may have the potential to be affected by similar problems.

3. Have performed a preliminary evaluation of the additional systems identified in (2) above and estimated that if deficient conditions will be identified, they will be within structural integrity limits.

4. Will reanalyze the systems identified in (2) above and evaluate the adequacy of the piping and associated support designs.

5. Will develop the appropriate support modifications if required.

Further details on the corrective actions taken to date are contained in Enclosure 1.

Name of the Organization Responsible for Corrective Action

Power Division of the United Engineers & Constructors Inc.

Length of Time that Will Be Taken To Complete the Action

By October 15, 1982

ANY ADVICE RELATED TO THE DEFECT OR FAILURE TO COMPLY ABOUT THE FACILITY, ACTIVITY, OR BASIC COMPONENT THAT HAS BEEN, IS BEING, OR WILL BE GIVEN TO PURCHASERS OR LICENSEES

Carolina Power and Light Company was advised by UE&C on August 13, 1982.

ENCLOSURE 1

10CFR21 Report of a Potential Defect Related to Snubber Misorientations in the Brunswick Station Units 1 and 2 - Carolina Power and Light Company

Corrective Actions Taken To Date

a) The system affected by the subject deficiency has been reanalyzed with the corrected snubber orientations. The analysis of the Safety/Relief Valve Discharge (SRV) Sheet 124 included the attached SRV Sheet 126, the Main Steam (MS) Sheet 14 and the High Pressure Core Injection (HPIC) Line. The results indicated that the maximum stress level and loads in some snubbers (at data point Nos. 1073, 1037 and 1057) in the SRV Sheet 124 exceeded the allowable limits but were within levels which assure the system's structural integrity. The other attached lines were all within the allowable stress limits.

b) An evaluation to determine the extent of the snubber misorientation was performed.

   - In the drywell, 16 additional sheets (representing worst and random conditions) were selected. Including the systems identified in (a) above, these systems contained 190 snubbers (approximately 70% of the snubbers in the drywell). Of these 190 snubbers, 29 snubbers were found with orientations exceeding the allowed tolerance and improperly represented in the piping analysis. Of these 29 snubbers, 8 have already been addressed in the reanalysis of the 3 sheets noted in a) above and the RHR Sheet 25 (see d below). Of the remaining 21 only 2 snubbers had misorientations of the magnitude which caused the deficiency described in (a) above. (The sheets containing these snubbers are MS Sheets 15B and 15C.)

   - In the reactor building, 9 sheets have been reviewed. These sheets included 150 snubbers (approximately 40% of the snubbers outside the drywell). Of these snubbers only 5 snubbers were found with minor misorientations.

c) An evaluation of the effect due to the finding in (b) above has been performed and it has been determined that the following additional sheets have the potential for being affected by the snubber misorientations and will be reanalyzed. These sheets are:

   - Main Steam (MS) Sheet 14A (and attached Safety/Relief Valve Discharge (SRV) Sheets 119 and 127).

   - Main Steam (MS) Sheet 15B (and attached Safety/Relief Valve Discharge (SRV) Sheets 121, 122, 125 and 237).

   - Main Steam (MS) Sheet 15C (and attached Safety/Relief Valve Discharge (SRV) Sheets 120, 123 and 187).

   - Feedwater (FW) Sheets 16 and 160.

   The above sheets account for the remaining 21 snubbers which were found to have angular deviations.

d) It is evaluated that the reanalysis that will be performed on the above 14 sheets plus that already performed on the 4 sheets previously noted will adequately address the generic aspects of the reported deficiency. The following factors were considered to arrive at this conclusion.

- The severe case of misorientation which resulted in the subject reported deficiency was caused by Snubber 1073 in the SRV Sheet 124. That case appears to be an error. No similar cases were found in the other 10 SRV sheets which include 81 snubbers.

- The other cases with sizable misorientation were detected in lines routed horizontally and parallel to the drywell wall, therefore, with long radius of curvature (such as portions of MS and FW sheets). In these cases, apparently some problem was encountered in reconciliating transverse and parallel (to pipe) snubber installations with the N-S, E-W coordinate system used in the analysis.

- Only a few cases with minor misorientations were found in systems inside the drywell which do not have the layout condition mentioned above (RHR Sheet 25, SLC Sheet 36, SRV Sheets 119, 120, 121, 122, 123, 125, 126, 127, 237 and 187). The same applied to the sheets reviewed outside containment (Sheets 37, 63, 4, 10, 18, 23, 38, 62 and 82). RHR Sheet 25 was selected for reanalysis as a typical line with minor deviations on the basis that none of the lines reviewed from outside the containment had greater snubber angular deviations. This reanalysis did not result in any conditions exceeding allowable limits. Therefore no further reanalysis will be performed on the lines outside the containment.

e) A preliminary evaluation of the systems identified in (c and d above) has been conducted including a preliminary reanalysis of Sheets 15B and 15C which contained the larger snubber misorientations. Based on the results of these analyses and on knowledge of existing design margin and conservatisms inherent in the present analyses, it has been estimated that no conditions exceeding structural integrity limits will be found.