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SUBJECT: Submits addl info re NUREG-0737, Item II.D.1, "Performance Testing of Relief & Safety Valves," addressing pipe supports for relief & safety valve piping, per NRC verbal questions.

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NOTES: Application for permit renewal filed. 05000400

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United States Nuclear Regulatory Commission
ATTENTION: Document Control Desk
Washington, DC 20555

SHEARON HARRIS NUCLEAR POWER PLANT
DOCKET NO. 50-400/LICENSE NO. NPF-63
PERFORMANCE TESTING OF RELIEF AND SAFETY VALVES

Gentlemen:

Carolina Power & Light Company (CP&L) hereby submits additional information concerning NUREG-0737, Item II.D.1, "Performance Testing of Relief and Safety Valves," for the Shearon Harris Nuclear Power Plant (SHNPP). This information addresses pipe supports for relief and safety valve piping in response to verbal questions from the NRC staff.

As discussed in Supplement 3 to the NRC Safety Evaluation Report (SER), Section 3.9.3.3, piping supports at SHNPP were designed in accordance with ANSI B31.1, "Power Piping" (1973), supplemented by the American Institute of Steel Construction (AISC), "Design, Fabrication, and Erection of Structural Steel Buildings," Seventh Edition, February 1969. The principle guidelines for pipe support design are included in the Harris Plant Engineering Section Manual of Instructions, Design Guidelines Section 7.2.A, "Piping Support/Restraint Design and/or Modification." As stated in SER Supplement 3, the NRC has determined that the applicability of the codes and standards used for pipe support designs is acceptable and that conformance of the design guidelines to the appropriate codes and standards is adequate.

In the SHNPP support design, each design level has a corresponding allowable stress. The following table lists the stress allowables at each design level:

<u>Loading</u>	<u>Flexure</u>	<u>Shear</u>
EQ 2 (Normal or Upset)	S	S
EQ 6 (Emergency)	1.33S	1.3S
EQ 8 (Faulted)	1.5S	1.3S

For standard components, the loads at each design level are compared to the corresponding manufacturer recommended allowable. As shown above, the allowables for EQ 6 are more restrictive than those for EQ 8. However, this fact is of no consequence to the piping supports in question because the reactions for both EQ 6 and EQ 8 are equal. Since the allowables used for all these supports were either Equation 2 allowables for EQ 2 loads; or EQ 2 or EQ 6 allowables for EQ 6 and EQ 8 loads, the designs are conservative and meet the design guidelines.

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The enclosed table shows what is perceived to be the most critically stressed support component (i.e., rolled member, weld, manufactured hardware item) and its respective stress or load allowable at each support.

If you have any questions concerning this information or require additional information on this subject, please contact me.

Yours very truly,



S. R. Zimmerman
Manager

Nuclear Licensing Section

JHE/lah (5256JHE)

Enclosure

cc: Mr. B. C. Buckley
Dr. J. Nelson Grace
Mr. G. F. Maxwell

ATTACHMENT 1
PIPE SUPPORT (CRITICAL COMPONENTS) DESIGN STRESSES

<u>Hanger No.</u>	<u>Type (1)</u>	<u>Node</u>	<u>EQ</u>	<u>Limiting</u>		<u>Critical Item</u>
				<u>Factor (2)</u>	<u>Design Limit (2)</u>	
RC-H-155	ANCH	6510	(8)	0.938	1.0 (EQ6)	Interaction
RC-H-156	RI	6490	(8)	0.28	1.0 (EQ2)	Interaction
RC-H-157	RI	6480	(8)	0.08 in.	0.31 in. (EQ2)	Weld Size
RC-H-199	SP	4110	(2)	0.135 in.	0.16 in. (EQ2)	Weld Size
RC-H-200	SN	6510	(8)	0.79	1.0 (EQ2)	Interaction (Embed)
RC-H-201	SN	4490	(8)	5076 lb/in.	5625 lb/in. (EQ2)	Weld Capacity
RC-H-202	SN	4500	(8)	33100 psi	35100 psi (EQ6)	AISC Member Check
RC-H-204	SN	4640	(8)	0.638	1.0 (EQ2)	Interaction
RC-H-205	SN	4765	(8)	5721 lb/in.	7254 lb/in. (EQ6)	Weld Capacity
RC-H-208	SN	4900	(8)	0.72	1.0 (EQ2)	Interaction (Embed)
RC-H-209	SP	3110	(2)	1041 lb/in.	3977 lb/in. (EQ2)	Weld Capacity
RC-H-210	SN	3510	(8)	0.73	1.0 (EQ2)	Interaction
RC-H-211	SN	3490	(8)	0.576	1.0 (EQ2)	Interaction (Baseplate)
RC-H-212	SN	3500	(8)	.355 in.	.375 in. (EQ2)	Weld Size
RC-H-213	SP	3480	(2)	0.15 in.	0.25 in. (EQ2)	Weld Size
RC-H-214	SP	2110	(2)	1498 lb.	2600 lb. (EQ2)	Component Allowable
RC-H-215	SN	2510	(8)	15.5 ksi	27.0 ksi (EQ2)	AISC Member Check
RC-H-216	SN	2490	(8)	21274 psi	27000 psi (EQ2)	AISC Member Check
RC-H-217	SN	2500	(8)	.96	1.0 (EQ2)	Interaction (Embed)
RC-H-218	SP	2480	(2)	.15 in.	.18 in. (EQ2)	Weld Size
RC-H-219	SP	5120	(2)	0.27 in.	0.31 in. (EQ2)	Weld Size
RC-H-220	SN	5170	(8)	0.18 in.	0.31 in. (EQ2)	Weld Size
RC-H-221	SN	5180	(8)	0.32	1.0 (EQ2)	Interaction
RC-H-222	SN	5230	(8)	0.64	1.0 (EQ2)	Interaction
RC-H-223	SP	5310	(2)	0.10 in.	0.25 in. (EQ2)	Weld Size
RC-H-224	SN	5360	(8)	0.145 in.	0.25 in. (EQ2)	Weld Size Check
RC-H-225	SN	5370	(2)	1252 lb.	6000 lb. (EQ6)	Component Allowable
RC-H-226	SP	5430	(2)	1244 lb/in.	2813 lb/in. (EQ2)	Weld Capacity

<u>Hanger No.</u>	<u>Type (1)</u>	<u>Node</u>	<u>EQ</u>	<u>Limiting</u>		<u>Critical Item</u>
				<u>Factor (2)</u>	<u>Design Limit (2)</u>	
RC-H-227	SP	5560	(2)	1773 lb/in.	3182 lb/in. (EQ2)	Weld Capacity
RC-H-228	SN	5760	(6)	1349 lb.	8000 lb. (EQ6)	Component Allowable
RC-H-229	SN	5750	(8)	1325 lb.	6000 lb. (EQ2)	Component Allowable
RC-H-230	SN	5700	(8)	.995	1.0 (EQ2)	Interaction
RC-H-231	SN	5800	(8)	.13 in.	0.25 in. (EQ6)	Weld Size
RC-H-232	SN	5830	(8)	1447 lb.	6000 lb. (EQ2)	Component Allowable
RC-H-233	SP	5820	(8)	0.15 in.	0.19 in. (EQ2)	Weld Size
RC-H-234	SN	5900	(8)	650 lb.	1500 lb. (EQ2)	Component Allowable
RC-H-235	SN	8240	(8)	600 lb.	1500 lb. (EQ2)	Component Allowable
RC-H-236	SN	8220	(8)	19490 psi	31000 psi (EQ6)	AISC Member Check
RC-H-237	SP	8180	(2)	6754 psi	25200 psi (EQ2)	AISC Member Check
RC-H-238	SN	8170	(8)	0.093 in.	0.187 in. (EQ2)	Weld Size
RC-H-239	SN	8160	(8)	744 lb.	6000 lb. (EQ2)	Component Allowable
RC-H-240	RI	5470	(8)	0.106 in.	0.187 in. (EQ2)	Weld Size
RC-H-241	SN	7240	(8)	1750 lb.	6000 lb. (EQ2)	Component Allowable
RC-H-242	RI	7220	(8)	0.22 in.	0.25 in. (EQ2)	Weld Size
RC-H-243	SP	7180	(2)	1024 lb.	2200 lb. (EQ2)	Component Allowable
RC-H-244	SN	7170	(8)	987 lb.	1500 lb. (EQ2)	Component Allowable
RC-H-245	RI	7160	(8)	1472 lb.	7000 lb. (EQ2)	Component Allowable
RC-H-246	SN	7100	(8)	22384 psi	28620 psi (EQ2)	Trunnion Check
RC-H-247	RI	6410	(8)	0.73	1.0 (EQ2)	Interaction
RC-H-248	RI	6430	(8)	0.83	1.0 (EQ2)	Weld Size
RC-H-250	SN	6260	(8)	0.12 in.	0.25 in. (EQ2)	Weld Size
RC-H-251	SN	6235	(8)	1604 lb.	15000 lb. (EQ2)	Component Allowable
RC-H-252	SN	6150	(8)	8.22 ksi	16.6 ksi (EQ2)	AISC Member Check
RC-H-253	RI	6210	(8)	.164 in.	0.50 in. (EQ2)	Weld Size
RC-H-255	SP	6310	(2)	.25 in.	.31 in. (EQ6)	Work with RC-H-495
RC-H-256	SN	6010	(8)	0.67	1.0 (EQ2)	Interaction
RC-H-258	SN	6020	(8)	0.28 in.	0.31 in. (EQ2)	Weld Size
RC-H-486	SN	8110	(8)	0.16 in.	0.19 in. (EQ2)	Weld Size
RC-H-487	SN	5570	(8)	0.102 in.	0.125 in. (EQ2)	Weld Size
RC-H-491	SN	2250	(8)	0.16 in.	0.19 in. (EQ2)	Weld Size

<u>Hanger No.</u>	<u>Type (1)</u>	<u>Node</u>	<u>EQ</u>	<u>Limiting</u>		<u>Design Limit (2)</u>	<u>Critical Item</u>
				<u>Factor (2)</u>			
RC-H-492	SN	4810	(8)	0.195 in.		0.50 in. (EQ2)	Weld Size
RC-H-493	SN	4920	(8)	0.25 in.		0.38 in. (EQ2)	Weld Size
RC-H-494	SN	2240	(8)	0.16 in.		0.19 in. (EQ2)	Weld Size
RC-H-495	SN	6330	(8)	0.25 in.		0.31 in. (EQ6)	Weld Size
RC-H-496	SN	6350	(8)	0.673		1.0 (EQ2)	Interaction (Embed)
RC-H-504	RI	6450	(8)	0.98		1.0 (EQ2)	Interaction (Embed)
RC-H-518	SP	6110	(2)	2370 lb.		2500 lb. (EQ2)	Component Allowable
RC-H-519	SP	6000	(2)	0.298 in.		0.313 in. (EQ2)	Weld Size
RC-H-664	SN	3240	(6)	0.22 in.		0.375 in. (EQ2)	Weld Size
RC-H-665	SN	3230	(8)	0.159 in.		0.188 in. (EQ2)	Weld Size
RC-H-666	SN	4250	(8)	0.398 in.		0.40 in. (EQ2)	Weld Size
RC-H-667	SN	4240	(8)	6803 psi		18000 psi (EQ2)	Weld Stress
RC-H-781	SN	5970	(8)	0.65		1.0 (EQ2)	Baseplate Interaction
RC-H-782	SN	5930	(8)	2035 lb.		7200 lb. (EQ2)	Component Allowable
RC-H-783	SN	6220	(8)	0.21		0.25 (EQ2)	Weld Size
RC-H-784	SP	4890	(2)	0.72		1.0 (EQ2)	Interaction (Anchor Bolt)
RC-H-800	Tie-Back	9230	(8)	0.56		1.0 (EQ2)	Interaction (Member)
RC-H-921	SN	9540	(8)	26426 lb.		50000 lb. (EQ2)	Snubber Allowable
RC-H-922	SN	9740	(8)	0.52		1.0 (EQ6)	Interaction (Trunnion)
RC-H-923	SN	9340	(8)	6346 lb/in.		7686 lb/in. (EQ6)	Weld Capacity

NOTES

(1) Hanger Type Legend

SN - Snubber

SP - Spring

RI - Rigid

ANCH - Anchor

(2) Entries without units are ratios

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