5. COMPARISON OF FREE END AMPLITUDE

There are now several sets of test and calculated data on free end amplitude taken on both the 13 x 11 and 13 x 12 replacement crankshafts at rated conditions. TDI's torsiograph data shows three to five amplitudes of selected orders and the corresponding SRSS value. SWEC test report shows a full array of the free end amplitudes, and its corresponding true sum results (0.69 degree). The experimental spread was 0.55 to 0.69 degree when several recordings were studied.

Original	TDI Test[8]			SWEC Test	FaAA Calc	TORVAP C Calc.	TDI Test		SWEC Test
Date	1/8/84[8]	*	**	1/8/84[8]	3/30/84[4]	5/19/84	9/28/83[4]	12/12/75	9/19/83[9]
Shaft / Order	13 x 12						13 x 11		
0.5			0.10	0.06	0.07	0.07			0.15
1.5		0.17	0.21	0.17	0.18	0.14		0.21	0.18
2.5		0.12	0.12	0.13	0.14	0.11		0.15	0.14
3.5				0.06	0.06	0.05			0.07
4.0		0.36	0.35	0.33	0.34	0.33		0.43	0.46
4.5				0.06	0.07	0.07		0.14	0.12
5.0			0.12	0.03	0.03	0.03			0.04
5.5				0.13	0.12	0.12			0.04
6.0				0.01	0.01	0.01			0.07
6.5				0.01	0.01	0.02			0.15
8.0						0.02			
SRSS	0.43	0.45	0.42	0.42		0.40	0.50	0.50	
True Sum				0.55 - 0.69	0.66	0.59			

* Shop Test for Gulf States, SN-74038, overall per meter
** Shop Test for EDOK-ETER, SN-74038, overall per meter

For the 13 x 11 shaft, the SWEC as well as TDI test data shows around 30 - 40% higher 4.0 order amplitude than that of 13 x 12 shaft. This indicates that the 13 x 12 shaft stress level is indeed significantly reduced. For the 13 x 12 shaft TORVAP C true sum amplitude checks well within the experimental spread of the SWEC test. In addition, TORVAP SRSS result checks within a few percent of the test data furnished by either TDI or SWEC.

4. "Evaluation of Emergency Diesel Generator Crankshafts at Shoreham and Grand Gulf Nuclear Power Stations," Failure Analysis Associates, Palo Alto, California, March 30, 1984.

8. "Field Test of Emergency Diesel Generator 103," Bercel and Hull, Stone and Webster Engineering Corporation. Figure 8-33. February, 1984.

9. "Emergency Diesel Generator Crankshaft Failure Investigation Shoreham Nuclear Power Station," Failure Analysis Associates, Palo Alto, California, October 31, 1983.