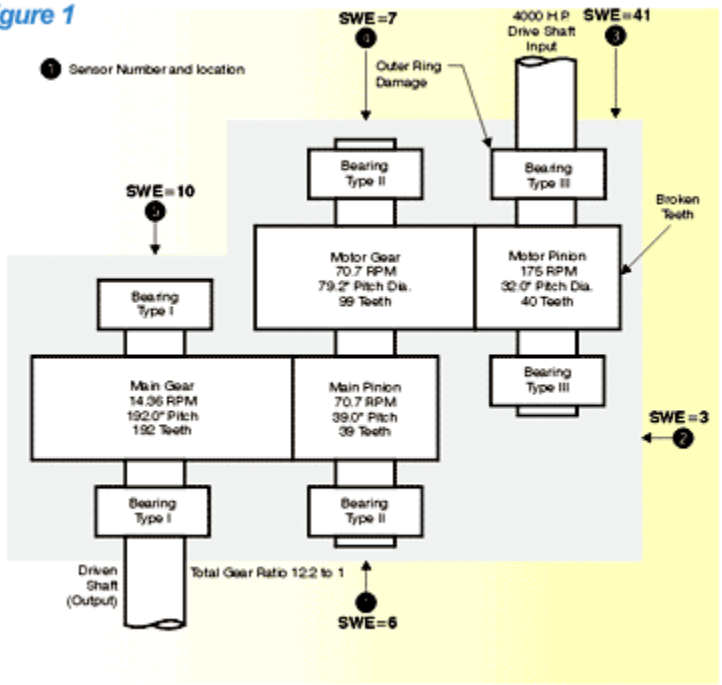
Monitoring Heavy Machinery Operating at Low Speed

Superior to all diagnostic efforts

Stress Wave Analysis (SWAN™) technology easily identifies gear damage on machinery operating at low speeds as shown in the following rolling mill gearbox test. The rolling mill gearbox has an input pinion speed of 175 RPM and an output shaft speed of about 14 RPM. The input pinion gear has a 32 inch pitch diameter, and the output gear has a pitch of 16 feet. A previous diagnostic effort using vibration measurement had been unsuccessful, since the low speed and large mass of the machine resulted in extremely low level housing motion (vibration). However, measurement of the Stress Wave Energy (SWE) indicated that the input pinion bearing read more than ten times as high as the same type of bearing on the opposite end of the same shaft. Spectral Analysis indicated not only outer race damage to the suspect bearing, but also tooth damage on the input pinion gear. This gear tooth damage was also verified by visual inspection.

The photo above shows how SWAN sensors are placed for monitoring heavy equipment.

Figure 1



Measurement of the Stress Wave Energy at the five sensor locations shown in Figure 1, indicated that the input pinion bearing near sensor #3 read more than ten times as high as the same type of bearing on the opposite end of the same shaft (sensor #2).

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