



Gearing Solutions for the Nuclear Power Industry



Nuttall Gear[®]
Altra Industrial Motion

In 2014, after decades of supplying nuclear parts through our strategic partners, Nuttall Gear decided to further our commitment to our nuclear customers by establishing our own Nuclear Quality Assurance Program.

Our 10CFR50 Appendix B program is implemented through ASME NQA-1 with Nuttall Gear also being an ISO 9001:2008 certified manufacturing facility. Our experience and commitment to quality are second to none, and by partnering with Nuttall Gear you can be assured that repairs and replacement components are genuine OEM quality and manufactured to meet or exceed original design specifications.



CUSTOM PRODUCT SOLUTIONS FOR A WIDE VARIETY OF NUCLEAR POWER APPLICATIONS INCLUDING:

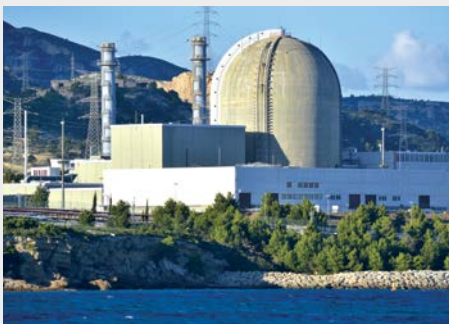
- Speed Increaseers
- Boiler Feed Pumps
- High Pressure Pumps
- Low Pressure Pumps
- Auxiliary Pumps
- Generator Drives
- Dual Drives
- Cooling Fan Backstops
- Fan Drives
- Pressurized Water Reactor Anti-rotation Device (ARD)
- Other Rotating Equipment

As the world's demand for nuclear power grows, the infrastructure and equipment necessary to produce and distribute it will come under increasing pressure to perform. As industry leaders in electromechanical power transmission products, Nuttall Gear and the companies in the Altra Industrial Motion family are uniquely positioned to leverage their products' reputations, reliability and technologies to help achieve the necessary nuclear power production the world requires.

As a leading multinational designer, producer and marketer of a wide range of electromechanical power transmission products, Altra offers products utilized in critical, safety-related nuclear power applications where reliability and accuracy are necessary to avoid costly downtime, assure safe operations and maintain production output.

www.nuttallgear.com

WHY DO CUSTOMERS CHOOSE **NUTTALL GEAR** OVER ANY OTHER BRAND?



Problem: A nuclear power plant in Spain suffered a catastrophic failure of its charging pump speed increaser. The cause of the failure was a loss of lubrication due to a rupture in one of the lubrication lines which had been modified by the utility without regard to the OEM design. The unit was rated for 1035 HP with an input speed of 1482 RPM and an output speed of 4854 RPM.

Solution: Nuttall Gear was the original supplier of the speed increaser and maintained all of the original drawings and specifications for the unit, which was manufactured in 1978. This allowed Nuttall Gear to supply a newly manufactured drop-in replacement unit without the need for costly and time-consuming reverse engineering. The speed increaser contained over 220 individual parts, with each part verified to meet or exceed the original specification.



High Speed Gear Increaser and Reducer Drives

Since the 1940's, the Nuttall Gear (formerly Westinghouse Gearing Division) SU High Speed Gear design has been proven through millions of hours of reliable operation. Nuttall high speed gear drives continue to be supported through new units, replacement gearing and parts. We can also rebuild your existing unit to OEM specifications.

New Applications

Nuttall Gear also excels in designing high speed drives to AGMA standards for custom applications such as compressors, fans, pumps, and turbines.

Standard Nuttall Gear design features:

- Rigid cast iron or welded steel housing
- Dynamically balanced precision double helical gearing for uniform load distribution and quiet running
- Oversized split sleeve bearings for smooth, efficient running
- Split labyrinth non contact oil seals for long life
- Self-contained forced oil lubricated gears and bearings

Available options include:

- Multi-speed (shifters)
- Remote mounted lubrication consoles
- Monitoring systems to measure temperature, pressure, and vibration
- Backup auxiliary lubrication systems



Factory Services

- Replacement or Spare Original Design High Speed Gear Drives

Rebuilds and refurbishments

Return your existing unit to original factory condition, meeting all original design specifications. All rebuilds are backed by a full factory warranty.

Engineering Services

Nuttall Gear has a fully staffed engineering and design staff. We will manufacture a custom drive solution to meet your needs and can provide design and power uprate studies.

Reverse Engineering Services

Reverse engineering and replacement manufacturing of obsolete gearing and components.

Gear Drive Testing

In addition to having one of the largest gear drive test floors in North America, Nuttall Gear has a separate test stand dedicated to high speed units. Customers are invited to witness the testing of their unit, with continuous vibration, temperature, lubrication system and sound monitoring.

Complete in-house manufacturing

We are a fully integrated manufacturing facility, with heat treatment, fabrication, machining, assembly and testing capabilities.



Field Services

Repairs And Rebuilds

Repairs, rebuilds and complete overhauls can be done right at your facility.

Inspections and Evaluations

Conditional assessment of gears, shafts, bearings, seals, lubrication pumps and housings. All field service inspections come with a detailed report that allows management to make informed decisions on maintenance and repairs.

Laser Alignment and Installation Assistance

Eliminate machine vibration and premature wear by verifying the proper installation and alignment of rotating equipment. Specially trained personnel use the latest methods and equipment available.

- Vibration Analysis
- Maintenance Training Seminars
- Assistance with Plant Maintenance Work Procedures

24 Hour Emergency Support

We maintain a staff of experienced technicians that are available 24/7 for rapid deployment in emergency situations.



Problem: A nuclear power plant located in New York needed replacement gearing for the main feedwater pump speed increaser. Put into service in 1970, the plant houses a single Westinghouse 2-loop pressurized water reactor that generates 4,930 GWh of power annually. The large pump increases the pressure of the water supplied to the steam generator. The original gearing, supplied by Nuttall in 1967, had become obsolete and was nearing the end of its service life.

Solution: Because Nuttall was the original supplier for the speed increasers in Westinghouse pressurized water reactors, costly and time-consuming reverse engineering was not necessary. Nuttall maintains all original design drawings and specifications for their speed increaser units.

Belted Drives and Sheaves	Couplings Cont.	Gearing	Linear Products
<p>TB Wood's <i>Belted Drives</i> Chambersburg, PA - USA 1-888-829-6637 – Press #5 <i>For application assistance:</i> <i>1-888-829-6637 – Press #7</i></p>	<p>TB Wood's <i>Elastomeric Couplings</i> Chambersburg, PA - USA 1-888-829-6637 – Press #5 <i>For application assistance:</i> <i>1-888-829-6637 – Press #7</i> <i>General Purpose Disc Couplings</i> San Marcos, TX - USA 1-888-449-9439</p>	<p>Bauer Gear Motor <i>Gearred Motors</i> Esslingen, Germany +49 (711) 3518-0 Middlesex, NJ - USA 1-732-469-8770</p>	<p>Warner Linear <i>Linear Actuators</i> New Hartford, CT - USA 1-800-825-6544 <i>For application assistance:</i> <i>1-800-825-9050</i> Saint Barthélemy d'Anjou, France +33 (0)2 41 21 24 24</p>
<p>Couplings</p>	<p>Electromagnetic Clutches and Brakes</p>	<p>Boston Gear <i>Enclosed and Open Gearing, Electrical and Mechanical P.T. Components</i> Charlotte, NC - USA 1-800-825-6544 <i>For application assistance:</i> <i>1-800-816-5608</i></p>	<p>Overrunning Clutches</p>
<p>Ameridrives <i>Mill Spindles, Ameriflex, Ameridisc</i> Erie, PA - USA 1-814-480-5000 <i>Gear Couplings</i> San Marcos, TX - USA 1-800-458-0887 <i>Universal Joints, Drive Shafts, Mill Gear Couplings</i> Erie, PA - USA 1-920-593-2444</p>	<p>Inertia Dynamics <i>Spring Set Brakes; Power On and Wrap Spring Clutch/Brakes</i> New Hartford, CT - USA 1-800-800-6445</p>	<p>Nuttall Gear and Delroyd Worm Gear <i>Worm Gear and Helical Speed Reducers</i> Niagara Falls, NY - USA 1-716-298-4100</p>	<p>Formsprag Clutch <i>Overrunning Clutches and Holdbacks</i> Warren, MI - USA 1-800-348-0881 – Press #1 <i>For application assistance:</i> <i>1-800-348-0881 – Press #2</i></p>
<p>Bibby Turboflex <i>Disc, Gear, Grid Couplings, Overload Clutches</i> Dewsbury, England +44 (0) 1924 460801 Boksburg, South Africa +27(0) 11 918 4270</p>	<p>Matrix <i>Electromagnetic Clutches and Brakes, Pressure Operated Clutches and Brakes</i> Brechin, Scotland +44 (0) 1356 602000 New Hartford, CT - USA 1-800-825-6544</p>	<p>Heavy Duty Clutches and Brakes</p>	<p>Marland Clutch <i>Roller Ramp and Sprag Type Overrunning Clutches and Backstops</i> Warren, MI - USA 1-800-216-3515</p>
<p>Guardian Couplings <i>Engineered Flywheel Couplings, Engine Housings and Pump Mounts, Flexible Shaft Couplings</i> Michigan City, IN - USA 1-219-874-5248</p>	<p>Warner Electric <i>Electromagnetic Clutches and Brakes</i> New Hartford, CT - USA 1-800-825-6544 <i>For application assistance:</i> <i>1-800-825-9050</i> Saint Barthélemy d'Anjou, France +33 (0)2 41 21 24 24 <i>Precision Electric Coils and Electromagnetic Clutches and Brakes</i> Columbia City, IN - USA 1-260-244-6183</p>	<p>Industrial Clutch <i>Pneumatic and Oil Immersed Clutches and Brakes</i> Waukesha, WI - USA 1-262-547-3357</p>	<p>Stieber Clutch <i>Overrunning Clutches and Holdbacks</i> Heidelberg, Germany +49 (0) 6221-30470</p>
<p>Huco <i>Precision Couplings and Air Motors</i> Hertford, England +44 (0) 1992 501900 Chambersburg, PA - USA 1-888-829-6637</p>	<p>Engineered Bearing Assemblies</p>	<p>Svendborg Brakes <i>Industrial Brakes and Brake Systems</i> Vejstrup, Denmark +45 63 255 255</p>	<p>Wichita Clutch <i>Pneumatic Clutches and Brakes</i> Wichita Falls, TX - USA 1-800-964-3262 Bedford, England +44 (0) 1234 350311</p>
<p>Lamiflex Couplings <i>Flexible Couplings, Bearing Isolators, and Coupling Guards</i> Cotia, SP - Brasil +55 (11) 4615-6300</p>	<p>Kilian <i>Engineered Bearing Assemblies</i> Syracuse, NY - USA 1-315-432-0700</p>	<p>Twiflex <i>Caliper Brakes and Thrusters</i> Wichita Falls, TX - USA 1-844-723-3483 Twickenham, England +44 (0) 20 8894 1161</p>	<p><i>For information concerning our sales offices in Asia Pacific check our website www.altramotion.com.cn</i></p>