

At ITW PP & F Korea Limited we are fully committed to a proactive approach to safety, health, environment and product improvement. Our commitment is well reflected in:

- · Our continuous Research and Developments
- Our on-going in-house Training and our in-house Training Facilities
- Our comprehensive range of Quality Products
- Our many long-term Repeat Customers





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About ITW

ITW (NYSE:ITW) is a Fortune 200 global multi-industrial manufacturing leader. The company's seven industry-leading segments leverage the unique ITW Business Model to drive solid growth with best-in-class margins and returns in markets where highly innovative, customer-focused solutions are required. ITW has nearly 50,000 dedicated colleagues in operations around the world who thrive in the company's unique decentralized and entrepreneurial culture. To learn more about the company and the ITW Business Model, visit www.itw.com.

To offer the best service to each market segment, ITW PP & F Korea Limited operates the following divisions that are branded uniquely for the most prominent recognition by users and customers:



OMEGA Ultimate Lubricants

Specializing in lubrication solutions - greases, oils and additives



MAGNA Welding Alloys

Specializing in gas and arc welding consumables for maintenance



CORIUM Industrial Chemicals

Specializing in industrial & commercial chemicals and adhesives



ZETALUBE Lubricants

A new lubricity dimension evolved from experience

We supply superior products that make maintenance:

√ Faster

✓ Safer

✓ More reliable

Our products are engineered to:

✓ Lower costs

✓ Reduce downtime
✓ Cut wastage

The OMEGA, MAGNA, CORIUM & ZETALUBE Trade Marks are the prop

The information contained in this publication supersedes all relevant information previously released and is to the best of our knowledge and accurate at the time of issue on November, 2023.

ITW PP & F Korea Limited is a business unit of Illinois Tool Works Inc. (ITW), U.S.A.



EMPOWERING the Power Generating Industries









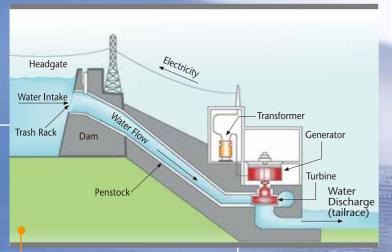




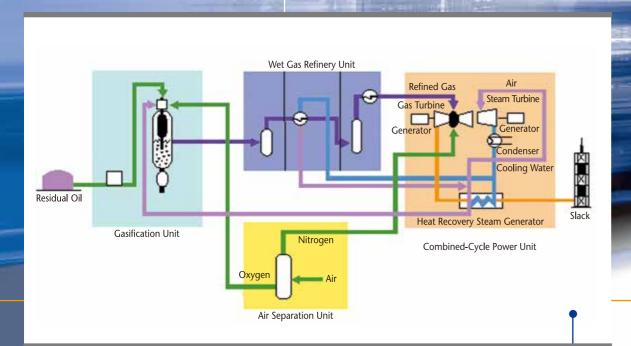
www.magnagroup.com



Whether you are an engineer, a maintenance professional or a manager of an electric power generating plant, you are among the most critical human assets backing up modern civilizations. Towns, cities and their firms and industries rely on uninterrupted power supply to operate. Your service to your power generating plants affects the lives of thousands, if not millions. You understand that the quality of your service largely depends on a comprehensive maintenance program that needs to put its top priority on "Zero Unplanned Downtime". Yet there are a few blind spots in power generation maintenance that have long been posing potential threats to you and your plants, and one of them is certainly – lubrication.



Hydro-Electric Power Generation While yours may be fossil fuel fired power, hydro power, geothermal power, or nuclear power, when it comes to lubrication and maintenance, you face similar challenges like heavy loads, high temperatures and water contamination in critical components like chains, compressors, couplings, engines, steam cylinders and turbines, etc.



Integrated Gasification Combined Cycle



OMEGA, a preferred name in lubrication since 1965, offers complete and specialized lubrication solutions to your power plant. As a winning division of ITW PP & F Korea Limited, a business unit of ITW, Inc., USA - the world's leading industrial services innovator, OMEGA has successfully leveraged its tribology expertise and developed the industry-best lubricants to satisfy and exceed the most stringent requirements in the power generating industry.

Teaming up a global distributor and lubrication consultancy network, OMEGA has been joining hands with professionals like you in the power industry to arrive at solutions for the lubrication related needs at your plants. We help you identify areas for improvement in your plant and work to elevate the productivity and lifespan of your equipment. You will be assisted in selecting the most optimum lubricant for a particular application. We know every kilowatthour counts. Availability, performance, costsaving and safety are 4 pillars of maintenance at the top of your mind and we are confident to help you deliver all the benefits to your plant plus your ultimate electricity consumers.

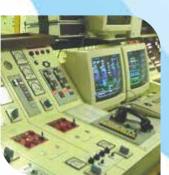


Partner for MRO Solutions

In lubrication, we understand your requirements better than any one else. Talk to your OMEGA expert today!









PowerPlantMaintenance



Power plant maintenance can be divided into two general categories: RoutinemaintenanceandPreventivemaintenance.

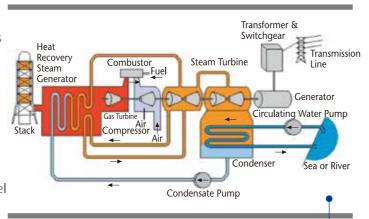
Routine Maintenance includes the hourly, daily, and weekly maintenance requirements recommended in the manufacturer's literature. Some routine maintenance and checks include the following:

- 1. Top up lubrication oil levels to the maximum levels
- 2. Re-grease and identify any contingency needs
- 3. Free movement of ventilation louvers
- 4. Drain water and sediment from strainers and filters
- 5. Maintainlevel ofcoolant
- 6. Check radiator and coolant hoses for leaks
- 7. Check battery electrolyte level
- 8. Check all switches for proper operation
- 9. Drain water from fuel tank
- 10. Fill fuel tank as required with appropriate diesel fuel
- 11. Check fuel tank for leaks
- 12. Log all operator maintenance in the operation log book when it is completed

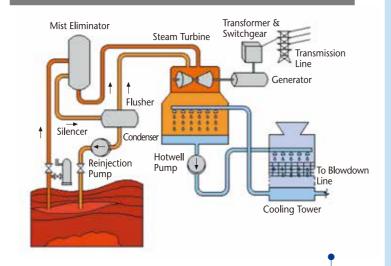
Preventive Maintenance requires the monthly, quarterly, semi-annual, and annual maintenance checks recommended in the manufacturer's literature. The maintenance supervisor is responsible for establishing a maintenance schedule to ensure the preventive maintenance is performed. A maintenance log book should be established for each generator plant and all maintenance checks recorded. The operation log book should be reviewed regularly to ensure that all preventive maintenance recommended by engine operating hours is scheduled; for example, the schedule of engine lube oil and filter replacement is normally based on hours of operation.

A power generation plant is a facility designed to produce electric energy from another form of energy, such as:

- Heat (thermal) energy generated from:
 - •fossil fuels:
 - coal
 - petroleum
 - natural gas
 - geothermal energy
 - nuclear reaction
- Potential energy from flowing water in a hydroelectric facility
- Wind energy (windmills)
- Solar energy using solar (photovoltaic) cells



Combined-Cycle Power Generation



Geothermal Power Generation



Transmission Fluid

and compressor applications.

CRITICAL COMPONENTS OF POWER GENERATION EQUIPMEN	LUBRICATION T CHALLENGES	OMEGA SOLUTIONS	OMEGA ADVANTAGES
Reciprocating Compressor	Oil thickening due to oxidation. Oil loss. Carbon and varnish deposits on the	OMEGA 613 Superior Air Compressor Oil	Advanced performance ashless air compressor lubricant designed to meet the most stringent requirements of the major compressor manufacturers.
	discharge valves	OMEGA 615 Synthetic Air & Refrigeration Compressor Oil	Fully synthetic supreme performance lubricant, specially designed for use in refrigeration compressors and heat pumps.
		OMEGA 670 Straight Mineral Gear Oil	Superior lubricating oil formulated to provide excellent anti- wear and friction-reducing properties as well as protection against rust and corrosion.
Rotary Screw Compressor	Oil foaming, oil thickening due to oxidation. Blockage of the oil separator and filters.	OMEGA 613 Superior Air Compressor Oil OMEGA 670 Straight Mineral Gear Oil	Extremely heavy-duty circulating oils formulated for continuous reuse in circulation lubrication systems for gears and bearings.
		OMEGA 615 Synthetic Air & Refrigeration Compressor Oil	Specially designed for lubricating severe duty reciprocating air compressors, rotary screw and vane air compressors.
1		OMEGA 699 Super Automatic Transmission Fluid	Premium quality multipurpose automatic transmission oil. Delivers exceptional protection against heat and oxidation.
Coupling	High loads, oil separation in greases	OMEGA 690 Super EP Gear Oil	Extra high performance coupling oil delivering superior extreme pressure characteristics and load-carrying properties. Lubricates all types of enclosed gear drives with circulation or splash lubrication systems.
		OMEGA 22 "Glide Sensation+" All Purpose Grease	Superior PTFE synthetic grease engineered for a wide variety of applications at extremes of temperature. Quality formulated with a synthetic base fluid and a special grade polytetrafluoroethylene (PTFE) constituent to ensure enhanced lubricity in punishing conditions.
The state of the s		OMEGA 57 Super Bearing Grease	Superior performance grease designed for use in high speed coupling applications. Super cohesive featuring high fiber strength paraffinic base oils to provide unprecedented built-in toughness.
Electric Motor	Requiring heavy-duty and long lasting lubricants	OMEGA 612 Universal Lubrication & Hydraulic Oil	Super multipurpose lubrication oil designed for almost all forms of machinery lubrication and equipment where EP oils are not recommended.
		OMEGA 615 Synthetic Air & Refrigeration Compressor Oil	High performance lubricant to satisfy a wide range of multi-use equipment requirements.
	TE IN A	OMEGA 22 "Glide Sensation+" All Purpose Grease	High performance lithium-complex greases, incorporating PTFE for enhanced lubricity. Synthetic base fluid.
		OMEGA 51 Superior Food Machinery Grease	Water resistant and dielectric grease, especially formulated for heavy duty applications. Provides maximum protection for long periods of time because it ensures total surface coverage, even under extreme conditions.

under extreme conditions.

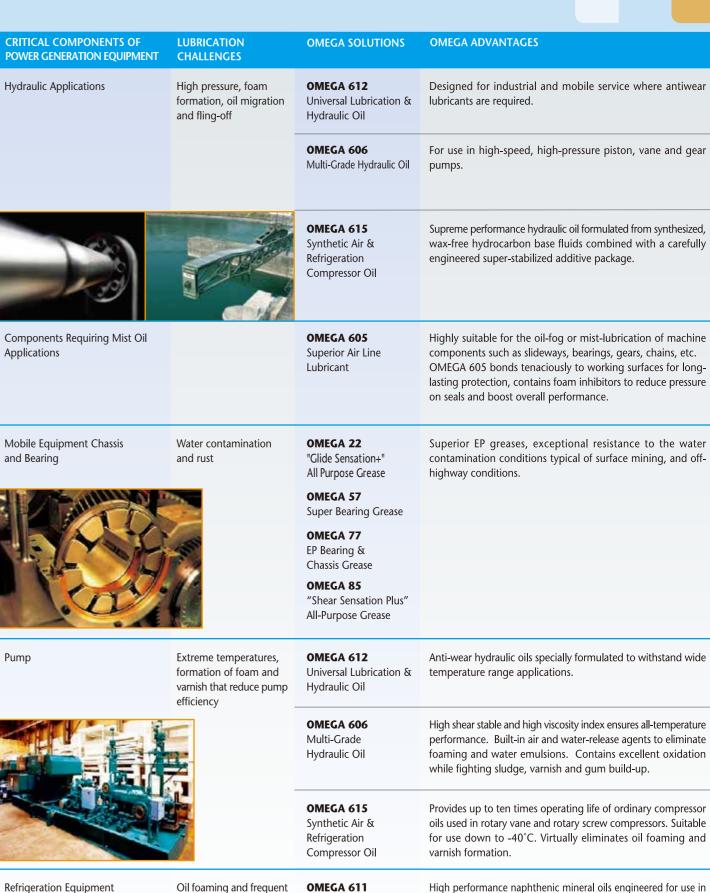


circulation or splash lubrication systems. Premium quality automotive lubricant formulated from select base oil and an advanced additive

system specifically for limited-slip differentials.



CRITICAL COMPONENTS OF POWER GENERATION EQUIPMENT	LUBRICATION CHALLENGES	OMEGA SOLUTIONS	OMEGA ADVANTAGES
Parallel Gear	High loads, wide range of temperature	OMEGA 22 "Glide Sensation+" All Purpose Grease	Supreme grease designed for a wide variety of applications at extremes of temperature.
Worm Gear	Heavy loads, slow speed, high energy consumption, foam and oxidation	OMEGA 680 High-Performance Worm Gear Oil	High performance high viscosity oil designed for use in enclosed worm gears operating at moderate to high speeds and temperatures, and where heavy loads and slow speeds prevail. Improves operating efficiency, saves energy, lowers operating temperatures and provides superior operating life for worm gear sets.
		OMEGA 690 Super EP Gear Oil	Specially designed for gear and bearing that provides outstanding equipment protection and extended oil lifetime.
		OMEGA 670 Straight Mineral Gear Oil	Heavily fortified against foam and oxidation. Enduring high heat and not compromising wear performance.
General Purpose Applications - Grease	Unpredictable and harsh conditions	OMEGA 22 "Glide Sensation+" All Purpose Grease	High performance lithium complex grease with PTFE for a wide variety of applications and severe operating conditions.
		OMEGA 33 Extreme Heat Resistant Grease	Supreme performance antiwear grease designed for high temperature applications. Remains stable up to 315°C. Unparalleled heat tolerating capacity.
		OMEGA 57 Super Bearing Grease	Exceptional resistance to water contamination conditions typical of power plants and similarly harsh environments.
		OMEGA 73 Waterproof Open Gear Lubricant	Non-solvent containing grease for the lubrication of open gears and bearings. Super affinity to metal to resist fling-off and wipe-off. Outstanding water resistance to minimize washoff in wet conditions. High EP properties to prevent gear surfaces scoring, galling and scuffing.
		OMEGA 77 EP Bearing & Chassis Grease	Formulated especially to resist oil separation in high speed rotating equipment, to protect against wear, rust and corrosion.
		OMEGA 85 "Shear Sensation Plus" All-Purpose Grease	High performance heavy-duty, polyurea-thickened multipurpose EP grease, for electric motor bearings. Shear-stable with excellent extreme pressure and load-carrying characteristics.
Hydraulic Applications	High pressure, foam formation, oil migration and fling-off	OMEGA 615 Synthetic Air & Refrigeration Compressor Oil	High performance lubricants to satisfy a wide range of multi- use equipment requirements.





Oil foaming and frequent cleaning needed. Wax deposit.

Super Refrigeration Oil

OMEGA 615Synthetic Air & Refrigeration
Compressor Oil

High performance naphthenic mineral oils engineered for use in refrigeration compressors. OMEGA 611 offers constant lubrication to rotors, pistons and bearings in all types of refrigeration compressor systems. Contains special foam suppressors to minimize foaming in compressors. OMEGA 615 is formulated with the blending of advanced synthetic POA (polyalphaolefin) for the most thorough lubrication. Leaves no harmful varnish or carbon deposits – eliminates maintenance cleaning of compressors.

CRITICAL COMPONENTS OF POWER GENERATION EQUIPMENT	LUBRICATION CHALLENGES	OMEGA SOLUTIONS	OMEGA ADVANTAGES
Components Exposed to Rust & Corrosion Attack	Oil separation, water washout, rust, metal corrosion & oxidation	OMEGA 95 Super Corrosion-Control Grease	Features exceptional shear stability, oxidation resistance and high penetration. Highly resistant to water and washout Excellent protection against rust, corrosion and wear.
		OMEGA 99 "Seize-Stop" Grease	Acts as a thread lubricant and sealant, guards against acid action metal seizing and galling, galvanic action, heat and rust action Stable from -130°C to 1093°C.
	A.	OMEGA 99N Nuclear-Grade "Seize-Stop" Grease	Finest quality nickel-based anti-seize compound for use in nuclear power plants. Protects all types of threaded assemblies, even a elevated temperatures up to 1,260°C.
1	The state of	OMEGA 612 Universal Lubrication & Hydraulic Oil	Specially designed as run-in or lay-up lubricant, provides effective rust preventive films on the internal surfaces of machinery. Turbing quality circulation oil containing anti-oxidants and defoamants.
		OMEGA 636 Jamaican-Base Universal Maintenance Oil	Made with pure Jamaican pimento oil for enduring qualit Four-in-one action – lubricates, penetrates, lifts water & inhib rust formation. Unprecedented standard of protection for metal surfaces against corrosion caused by oxidation.
Steam Cylinder	High temperatures and corrosion	OMEGA 670 Straight Mineral Gear Oil	100% straight paraffinic gear oil designed for high-purit applications. Withstands acid, heat and wear. Provide exceptional protection against metal corrosion and oxidation
Transmission, Differential and Final Drive	Acids, sludge and carbon deposits	OMEGA 690 Super EP Gear Oil	High quality commercial gear lubricants formulated from sele based oils and an advanced additive package. Engineered to meet the most demanding extended drain and OEM requirement
		OMEGA 699 Super Automatic Transmission Fluid	Provides superior thermal stability – resists temperatures uto 176°C. Completely sulfur-free to prevent damaging action – improves system cleanliness for optimul transmission performance. Free from heavy waxes found ordinary transmission fluids – prevent sludge or carbon solid
Gas Turbine	High operating temperatures leading to premature turbine oil failure. Requires lubricants with high temperature oxidative stability (175°C), good air release, minimized foaming and no rusting	OMEGA 612 Universal Lubrication & Hydraulic Oil	Engineered for use in gas and steam turbines and application under the most severe operating conditions. Anti-magnet formulation – will not attract metallic dust & particles. Super lubrication with anti-wear and anti-rust additives for consistent ar long-lasting protection. Ideal for turbine application with its hig viscosity index – viscosity remains constant throughout temperatu fluctuations and retains its texture regardless of varied condition Special supplements to promote interface tenacity and hold lubrical in position – resists migration and fling-off. Special anti-foal additive – resist foam formation even at elevated temperatures.
Steam Turbine	Constant and harsh water contamination, reduces oxidation stability and promotes rust. Extreme heat causing reduced turbine oil life through elevated oxidation. Need lubricants with moderate temperature oxidative.	OMEGA 612 Universal Lubrication & Hydraulic Oil	Premium performance turbine oil that is engineered to mee the requirements of the most severe steam turbine designs an operation, with maximum oil charge life. Offers superior proper retention capabilities against premature oxidation because a additive dropout and base stock oxidation. High quality bas stocks, characterized by higher percentage saturates, lowe percentage aromatics, and lower sulfur and nitrogen levels.
	temperature oxidative stability (95°C), excellent water-shedding and air release properties, minimized foaming as well as no rusting	OMEGA 606 Multi-Grade Hydraulic Oil	Ideal for steam and hydro turbine sets and other systems when long lubricant service life is required. High shear stable an high viscosity index ensures all-temperature performance Built-in air and water-release agents to eliminate foaming an water emulsions. Contains excellent oxidation inhibitors protects against rust and corrosion while fighting sludge, varnis and gum build-up.



OMEGA "7 - Point" **Maintenance & Lubrication Program** for Turbines



 Comprehensive Inspection Prior to Filling 	A comprehensive site inspection is necessary to assess logistics requirements, the specification and volume of lubricants, filtration and purification methodologies and potential HSE spill containment.
2. Commission Fill & Recirculation	Commission fill & recirculation incorporates on-site filling of oil into the turbine and the removal of solids contamination from turbine manufacture and installation. The oil should be filtered according to equipment specification.

3. Oil Change The regular process includes properly dispose waste of used turbine oil, refilling the turbine and filtering the oil to equipment specification.

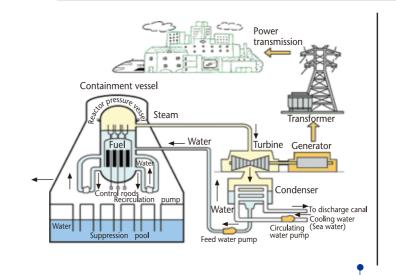
4. Recirculation This involves the removal of solid contaminants and soluble water from turbine **Filtration** oil. They are essential in maximizing the life of your turbine oil. After each & Purification service, the oil should be tested according to the specifications of the equipment as well as the expert recommendation of the lubrication provider.

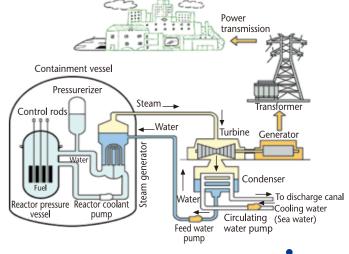
5. Failure Flushing It is intended to isolate the nature and possible location of debris from failure and instituting a flushing regime that concentrates on the impacted area.

6. Filtration of Bulk While ancillary and bulk storage facilities are only required on an as needs basis, Storage & Ancillary water and other particulates can often accumulate. An annual filtration should Systems be planned to remove these contaminants and get these systems clean and dry, and ready when needed.

7. Survey and Study on Filter service life can be optimized and associated maintenance costs reduced Oil & Filtration

by conducting this survey and study. The objective is to ensure that system cleanliness targets are achieved.





Nuclear Power Generation – Boiling Water Reactor

Nuclear Power Generation – Pressurized Water Reactor