

The Title , the Principle and the Potential.

The reader of the early 1990's , having carefully and honestly completed comprehension and evaluation of this work and found no concept-killing flaws in its contents, would more effectively envision with the author what the society of the early 2020's may consider as commonplace in daily life, thanks to the efforts of enterprising and visionary people of society thirty years before.

They clearly perceived the enormous potential for the Inertial-Pneumatic Electric Power Concept , as proposed by an obscure retired senior design engineer and inventor of those days from Wisconsin , among others, and initiated prompt action toward early development of prototypes. Their efforts snow-balled into early mass production and distribution which has been sustained and expanded until daily life in the early 2020's has become a wonderland of prosperity, peace and a reclaimed clean environment in which to live each day.

Fossil fuels and atomic energy have been banned , by law, from use through out the world as energy sources for the generation of electric power , the propulsion of transportation vehicles and the manufacture of planet threatening atomic bombs. The large central electric power plant has become obsolete and converted to other uses. The countryside landscape is no longer marred by high voltage power transmission lines, since electric power production has been totally decentralized and localized. Huge area blackouts are a thing of the past , along with electric power interruptions due to storm damage to transmission equipment. The centralized power plant is no longer available as a prime target of terrorists, saboteurs and enemy military action.

Each condominium , apartment building, hotel, motel, high rise building, merchandising mall, hospital, service facility and manufacturing facility has its own electric power production facility, sized to more than adequately satisfy its requirements for electric power. Hydro-electric power facilities no longer produce electric power and are utilized for flood control and irrigation purposes only. All new single-family dwellings, as well as millions of converted older dwellings, are now all-electric and have their own electric power production facility in the basement , garage or storage shed. Most are no larger than the central heating system of former years and no more costly in purchase price, thanks to astute development and mass production. Each is capable of producing twice as much electric power as the resident family consumer will ever need, at zero operating cost, beyond amortization of purchase price, and very meager maintenance costs. Each operates as silently and dependably as the contemporary refrigerator or freezer and has a comparable, if not longer, service life.

The family automobiles are electrically propelled, probably by electric motors at each wheel, which serve as both propellor and brake. Electric power is very adequately supplied by an Inertial-Pneumatic Electric Power unit under the hood in front or perhaps in a rear compartment. It is no larger than the internal combustion engine of former years and just as powerful, if not more so. Vehicle size, performance and passenger accommodations are designed and produced to suit consumer preferences , since manufacturers have been freed of the energy and pollution restrictions of former years.

The black smoke, the roar or deep rumble, spewing from the exhausts of the deisel internal combustion engine, of former years, no longer pervades the highways and railroads as electric powered common

carrier vehicles, the trucks, buses and trains, move silently, and so very economically, transporting the materials and personnel of the burgeoning economy to an incredibly wide variety of destinations, thanks to near zero energy costs and greatly reduced transportation costs.

Oil wells and oil pipelines around the world have been abandoned and plugged. Early on, with the handwriting on the wall, petroleum products producers applied venture capital to the development of large scale sea water desalination systems, made feasible and economically practical by the low cost and very flexible energy of Inertial-Pneumatic Electric Power facilities. Many oil pipeline systems have been converted to carry unlimited supplies of desalinated sea water to where ever it is required or can be effectively utilized to improve an area's economic growth, human life styles and standards of living.

Near east oil producing countries have been deprived of their energy strangle hold on western nations' economies but also, in a like response to the handwriting on the wall, have diverted much of their immense accumulated oil income wealth to the development and installation of sea water desalination and distribution systems, thereby providing unlimited fresh water supplies through out their sovereign territories. Desert areas have been converted to lush green agricultural areas and oil income has been replaced by food and fibre income and a much improved life style and standard of living for its citizenry, including unlimited air conditioning for complete comfort in formerly unbearable desert conditions.

Oxygen, lumber and fruit producing trees have been planted by the multiple trillions in heretofore remote and useless areas of the world and are doing well on the fertilized and desalinated sea water readily

available to them as required. The new and plentiful fresh water supply, thanks to the incredible impact of Inertial-Pneumatic Electric Power Systems, has been a tremendous benefit to agricultural irrigation. Natural irrigation from rainfall and snowfall into rivers and reservoirs contains salts and minerals washed from the soil of river bottoms. Over extended periods of such irrigation, evaporating water leaves salt deposits in the soil which are harmful to plant life and growth. No such deposits occur with the new desalinated sea water irrigation fresh water supply.

In the 1990's, much of the plastics industry was based on petroleum derivatives as the primary ingredients of their massively marketed products. However, even then the industry was confronted by a world wide and ever growing waste disposal problem created by the non-degradable nature of many plastics. Since then the industry has been virtually forced to develop substitute fully degradable materials and to eliminate petroleum derivatives as their primary ingredients. This may have been the final nail in the coffin, for in these early 2020's, virtually nothing remains of the once dominate fossil fuels industries, for the slide into oblivion has carried with it the natural gas and coal industries. The capital and personnel assets of these former industries has long since been shifted to further development and production of Inertial-Pneumatic Electric Power systems and to the various fields of industry impacted by them.

Atomic powered aircraft carriers and submarines of the world's navies have been converted to the new unlimited and mobile electric power sources. Most are still propelled by steam turbines but heat to generate steam for them is provided by electric power rather than atomic power. Passenger and freight ships, plying the world's sea lanes, super

heat the steam that drives their turbines with electric power, utilizing space on board, once occupied by fuel storage, for additional payload. New ships, sliding down the ways of shipbuilders, are all-electric, as specified by the new owners, for greater economy and transportation profits. Perhaps this signals the beginning of the end for steam power of all varieties, after over two-hundred years of faithful but wasteful service in turning the wheels of industry and transportation.

The huge oil carrying super tankers of former years, for the most part, have been converted to fresh water carrying super tankers, transporting vast quantities of natural fresh water, derived from icebergs and glaciers of the north and south polar regions of the earth, to all areas of the world where supplementing desalinated sea water supplies is a practical and economical endeavor. The conversion of ice to fresh water is accomplished by conversion ships, permanently anchored off some of the largest fresh water ice fields, which are electrically powered through out all of their continuous conversion functions. Their product is stored in the holds of permanently anchored nearby super tankers, acting as holding tanks awaiting the arrival of the next transporting supertanker. The day of the dreaded and devastating oil spills, from super tankers such as these, has long since been over and its memories are gradually fading into the past as the nightmare of past generations.

The world's military establishments have long since converted their armored and transport vehicles from fossil fuel combustion engines to electric propulsion, thereby vastly expanding the operational boundaries of their mobile armor and significantly reducing transport logistics and risk to transport personnel. Jet aircraft are still propelled by the thrust of jet engines but the rapid gaseous expansion that formerly

generated the thrust is now developed by super hot electric heaters which rapidly expand pressurized atmospheric air from powerful rotary compressors to adequate thrust pressure, rather than by the former jet fuel combustion. Naturally, this has been a tremendous boost to both military and civilian air travel and transport, operating with virtually unlimited range, lower operating costs, greater safety and larger and more profitable payloads.

The economies of all nations around the world , since the advent of Inertial-Pneumatic Electric Power systems in the 1990's, have experienced a period of growth and prosperity unequalled in all history since the beginning of the industrial revolution over two-hundred years ago. The flexibility of the new electric power producer has distributed its enormous benefits to all parts of the world , resulting in greater harmony and more even distribution of the world's wealth and health to all nations than ever before and strife among nations for economic reasons is fast becoming a thing of the past.

Race cars at the Indianapolis 500 and other major races have converted to electric propulsion and they whiz around the track almost silently at higher speeds than ever before but with much greater safety and better control than the fuel burners of former years. No more fiery crashes and no more pit stops for fuel, blown engines or broken down power trains. Crashes still occur, as might be expected from the higher speeds, but with less frequency , thanks to better controls and improved track engineering. Race car construction and maintenance costs have also been significantly reduced by the simpler and more reliable electric propulsion systems.

Even the small engine community has discarded internal combustion in

favor of electric power to propel its lawn mowers , chain saws, garden tractors, small boats and miscellaneous other small mobile equipment.

Naturally, farm tractors and all other mobile farm equipment has been converted to electric power propulsion and the economy of eliminated fuel costs has been reinvested , by most of the agricultural community, in a vastly expanded irrigation and fertilization program that assures a regular and profitable harvest, utilizing the unlimited , low cost and flexible new electric power supply, and has gradually reduced the annual gamble on the weather, forced upon the agricultural community of former years.

Does this glimpse into the future seem more like science fiction than science fact? Is it unbridled and uninhibited fantasy devoid of factual foundation ?

The reader is hereby challenged to read on because if you have the "right stuff", which includes a curious and open mind, reasonable intelligence, perhaps an acceptable background in fundamental physics and mathematics at the high school level, since certainly no more than that is required, and , most importantly, a sincere desire to learn if there really is an available way out of the contemporary energy and ecology dilemma , let this work introduce you to inertia, in a more comprehensive way than you have ever known before. Perhaps then , and only then, will you be appropriately prepared to decide for yourself if its descriptive glimpse into the society of the 2020's can ever become commonplace reality.

The Inertial-Pneumatic Electric Power System is so identified because inertia , in its centrifugal force function, which is its most common function by the way, is its source of energy and its prime mover.

It utilizes inertia as an extremely powerful free natural pneumatic compressor in precisely the same manner as both man and nature utilize it as an incredibly powerful free natural gravity neutralizer to perpetually sustain the configuration and function of all orbital systems in outer space, since the same fundamental physics is appropriately applicable to both.

In the most simple terms, the system converts inertia, in the centrifugal force function, to pneumatic pressure, then converts pneumatic pressure to rotational power and, finally, converts rotational power to its end product, electric power. Its fluid medium in the energy conversions is very dense air, which also serves as the operational fluid environment for the entire system. It recycles its fluid medium by means of an internal fluid transfer system which has no end and circulates and recirculates the fluid medium through the system perpetually at a constant rate, as it flows under the natural impetus of inertial-pneumatic compression, in precisely the same manner as standard air flows through a household vacuum cleaner under the impetus of a blower driven by an electric motor.

This operational principle has an excellent analogy in that of all hydro-electric power systems, which convert earth gravity, functioning as a free natural fluid pressurizer, to hydraulic, (water), pressure then convert hydraulic pressure to rotational power and, finally, convert rotational power to their end product, electric power. Their fluid medium, in the energy conversions, is water which is recycled through a massive external fluid transfer system identified as the natural rainfall system. The fluid medium flows continuously through the endless natural transfer system under the constant impetus of earth gravity but not necessarily at a uniform rate.



Optionally , it may be stated that the flow of fluid medium begins as earth gravity attracts raindrops or snowflakes to its surface, perhaps to the upper regions of a mountain range , where , if they are snowflakes , they will accumulate to great depth , lying in wait for the warmer temperatures of spring before resuming their flow through the natural fluid transfer system. If they are raindrops , flow continues, uninterrupted, as they collect into rivlets, into streams and thence into rivers, driven relentlessly downward toward sea level by earth gravity. By chance some of them may eventually become a part of a river that flows into a dam which supplies hydraulic , (water) , pressure , developed by earth gravity, to the turbines and electric power generators at its base, thereby contributing their part to the first energy conversion.

After lying idle for some time, within the confines of the dam, some of them may find themselves being forced by earth gravity toward the bottom and on into and through control valves and thence through huge aquatic conduits and onto the sloping and curved blades of a huge turbine . Individually, their earth gravity weight is minute but collectively, in enormous numbers, their combined weight exerts enormous vertically downward pressure against the turbine blades. The pitch of the turbine blades converts a portion of that downward force into a tangentially directed turning force, delivered at low velocity, in terms of feet per second, but in enormous volume , in terms of pounds of turning force or torque, so as to produce high level rotational power, in terms of foot-pounds per second, horsepower and kilowatts. Because the electric power generator is usually secured to the vertical turbine shaft , the final conversion to electric power is automatic.

So ends the raindrops' contribution to the second and final energy conversions and as they leave contact with the turbine blades, they are no longer under heavy hydraulic pressure from all directions but are still being driven relentlessly downward toward sea level by earth gravity. So they find themselves being guided back into the river, from whence they entered the dam, and resume flow to the nearest sea level body of water which may, in fact, be the nearest ocean. This marks the end of their downward flow since earth gravity can move them no closer to earth's center of gravity. The way is blocked by earth's own solidified and nearly impenetrable mantle.

Some of the drops may mingle with the ocean water for some time, moved about by currents and waves and absorbing the salinity of the ocean water about them. However, they did not enter the ocean entirely free of salt, like they may have been as they fell to earth as raindrops, provided that the specks of dust at their centers were salt free. As soon as they struck the earth's surface and began to collect in rivulets, they began collecting minute amounts of salt from the beds of the rivulets, streams and rivers. By the time they reached the ocean water, each carried a minute but measureable amount of salt with it. Of course these tiny deposits of salt are left behind as the sun's heat converts ocean water to pure water vapor which immediately begins to rise into the upper atmosphere, squeezed upward by earth gravity as it pulls the heavier air around the vapor with greater force than it exerts on the lighter water vapor. Millions of years of this process has resulted in the contemporary salinity of ocean waters.

Included in one such rising column of water vapor may be some of the recycling raindrops. They have traveled perhaps three hundred miles from their entry into the dam and here they are being squeezed upward

for perhaps another seven or eight miles. When they left the ocean's surface they were very warm from the sun's heat but they have been cooling steadily as they rise. Near the end of their upward route, they are exposed to the very cold temperatures of the upper atmosphere which causes condensation to begin and the water vapor becomes minute droplets of water or snowflakes forming around equally minute specks of dust which are ever present eternally through out earth's atmosphere. Soon the collected droplets become too heavy for the thin upper atmosphere air to support and earth gravity pulls them relentlessly toward its surface. By an incredible billion-to-one happening, some of them strike the earth's surface very near the area where they started their fluid recycling journey. Thus, the first cycle ends where the second cycle begins and the length of the natural fluid transfer system has been perhaps six hundred and fifteen miles.

Compare this journey of typical raindrops through the fluid recycle system of the typical hydro-electric power facility to that of a few typical pneumatic particles through the fluid recycle system of a typical Inertial-Pneumatic Electric Power system, since these two systems bear such a remarkable resemblance to one another. The heart and core of the latter system is its hollow cylindrical Pneumatic Mass which is housed and governed by the Rotor Assembly. Its counterpart in hydro-electric systems is the body of water in each of their dams. The dimensions of the Pneumatic Mass are the choice of finalizing system designers but for this analogy of fluid recycle journeys they are considered to be as follows.

Its inside diameter is 1.125 inches. Its outside diameter is 3.125 inches and its length is 22.000 inches. Its standard air volume is 146.868 cubic inches and the area of its outside surface is 215.985

square inches. When the system is in its idle mode, just before start-up, its earth gravity weight is .904 pound because of the high average density of the Mass, as specified by system finalizing designers. This is one-hundred and thirty-seven times what its weight would be if it was composed of standard air such as a person would breathe at a sea level location. When the system is in its operational mode, the inertially compressed weight of the Pneumatic Mass becomes an incredible 1,143,541 pounds. This is because, for its operational mode, system finalizing designers have specified that the Pneumatic Mass must be rotating at a constant 2000 revolutions per second or 120,000 revolutions per minute, (RPM). At this rotational speed, or orbital velocity if you will, the enormous power of inertia becomes like an artificial gravity, precisely like earth gravity except in strength, which attracts the pneumatic particles, comprising the Pneumatic Mass, with great force radially outward from Mass inside surface to its outside surface, where they are pressed hard against the inner surface of the Restraining Agent, which is a vital part of the Rotor Assembly. This artificially generated gravity is commonly known as Centrifugal Force but it actually is Inertia in its most common function.

The strength of gravity, be it earth gravity or the artificial gravity generated within all rotating machines automatically and without cost in input energy, is measured by the rate at which it will accelerate a free moving body of matter which is within its field of influence. Earth gravity accelerates such a body at the constant rate of 32.16 feet per second during each second of acceleration. The artificial gravity, that acts upon the pneumatic particles of our descriptive journey through the system's fluid recycle transfer system, accelerates such a body at the rate of 17,646,974 feet per second during each

second of acceleration. This means that if it could attract the mass of one of our recycling pneumatic particles toward the inner surface of the Restraining Agent for one full second, without any outside influence, it would increase its velocity from zero feet per second to 17,646,974 feet per second. This means that the gravitational force, that pressurizes the air in the Pneumatic Mass of this typical Inertial-Pneumatic Electric Power system, is over 548,724 times as strong as the earth gravitational force that pressurizes the water in a typical Hydro-Electric Power system and it is just as free as earth gravity.

Such a great force attracting the entire Pneumatic Mass into interface with the Restraining Agent inner surface greatly compresses the millions of pneumatic particles in the mass tightly together and causes a significant increase in pneumatic pressure from the inside surface of the Mass to its outside surface. This increase in pressure is identified as Inertial-Pneumatic Compression, the prime mover and energy source of the Inertial-Pneumatic Electric Power Concept.

The reason this is a practical and feasible concept is because the generation and maintenance of this enormously strong artificial gravity pneumatic compressor costs nothing in input energy, once the constant rotational or orbital velocity has been established and sustained. Proof of this lies in the fact that the fundamental physics involved is precisely the same as that involved in the orbital systems in outer space and it is obvious that the gravity neutralization in all such systems costs nothing perpetually in input energy from outside the system, once it has been established in its operational mode.

The moon's orbital velocity and its orbital radius is such that just enough natural anti-gravity is exerted by inertia to attract the

moon away from earth's center with precisely the same accelerating force that natural gravity attracts it toward earth's center. It is also the inertia of the moon's forward motion that sustains its orbital velocity and critical time period (t) perpetually at the appropriate constant level. The critical time period (t) is the elapsed time required to complete one orbit, a factor that will be examined and explained very comprehensively in subsequent chapters of this work.

It can do this effectively and perpetually because in the perfect vacuum of outer space there is zero resistance to the moon's forward motion. Thus, trillions upon trillions of ton's of such inertially powered anti-gravity has been maintained continuously for perhaps four billion years without one foot-pound of input energy being added to the system.

The recycling journey of our typical pneumatic particles begins as they enter the entrance bores of the hollow shaft at the axial centerline of the Rotor Assembly and through the other pneumatic conduits leading to the inner surface of the Pneumatic Mass within the Rotor Assembly. However, once they have strayed off the centerline of the entrance bores, they come under the influence of the Impellor, which is that vital part of the Rotor Assembly that assures that the Pneumatic Mass and all parts of the Rotor Assembly rotate in precise unison at precisely the same rate. This means that particle rotation about the axial centerline begins immediately as soon as they stray off that centerline. It also means that they immediately come under the influence of the strong artificial gravity referred to above and are forced relentlessly radially outward toward the inner surface of the Restraining Agent.

Thus as they move radially outward from the inside surface of the Pneumatic Mass to its outside surface, a distance of 1.000 inch, they are simultaneously moving tangentially in the direction of rotation, as they are forced to rotate about the axial centerline in precise unison with the millions of other particles in the Mass. There is a vast difference, however, in the velocities of the radial and tangential motions. They will move the 1.000 inch radially outward in perhaps .331 second, which means that their radial motion velocity is perhaps .252 foot per second. During that same .331 second time period, they will complete perhaps 662 revolutions about the axial centerline. This means that they will move tangentially at the average velocity of perhaps 1113 feet per second. The combined motions causes each particle to describe a path of motion in space which is a very tight spiral in its over all configuration. The advance of each particle per spiral revolution may average .0015105 inch but it is not uniformly that amount.

The fact that the particles are moving radially outward through a rapidly expanding pneumatic conduit, coupled with a uniform increase in pneumatic density from Mass inner to outer surfaces, causes radial advance per spiral revolution near the inner surface to be perhaps 6.285 times as great as that near the outer surface. Thus, radial advance per spiral revolution near the inner surface may be .0026057 inch while that near the outer surface may be as little as .0004146 inch. The importance of these very small radial advances per spiral revolution will be fully explored and explained in subsequent chapters of this work. Suffice to state, here in Chapter One, that they indicate a high level of inertial-pneumatic compression efficiency.

Naturally, as the recycling particles advance radially outward, they are

exposed to uniformly increasing pressure from all sides exerted by adjacent particles. However, that is all the particles sense. Bear in mind that everything within the Rotor Assembly rotates together in precise unison and, because all motion is relative to adjacencies, there must be a velocity difference between adjacencies before motion can be sensed by any of them.

What this means is that the particles may at times sense low level radial motion at relatively low velocity because there are always minute velocity differentials between them as they constantly shift into their individual flow positions in a uniformly expanding conduit. However, they have no sense whatsoever of their tangential motion through space at over 1200 feet per second because there is never any velocity differential between particles in this direction.

Proof of this is seen in the fact that a person standing on the earth's surface near the equator has no sense of moving through space at 1000 miles per hour, or 1467 feet per second, because of the earth's rotation. Likewise, a person riding a jet plane well above the clouds and looking out at empty sky, will sense no forward motion at 700 miles per hour, or 1027 feet per second, until another plane passes within view in the opposite direction.

Eventually our recycling particles find their way into the entrance of one of the two Thrusters, which are vital energy converting parts of the Rotor Assembly. Their function is to utilize whatever pneumatic pressure differential, between their entrances and their exits, that has been provided for them by inertial-pneumatic compression, and convert it to tangentially directed, Rotor Assembly propelling, thrust in the direction of rotation, exerted against two small areas of the



Restraining Agent body which are centered at a radial distance of 1.718 inches from the axial centerline of the Rotor Assembly.

They actually are miniature rockets, or jet engines, operating on the gaseous pneumatic pressure generated by inertial-pneumatic compression rather than on the gaseous pressure generated by rocket fuel combustion for satellite launching rockets or the gaseous pressure generated by jet fuel combustion for the jet engines that propel aircraft. Like all rocket forms, they have the unique ability to produce propelling thrust at a constant level regardless of the forward velocity of the vehicle. Thus, propulsion power produced by them is directly proportional to thrust times forward velocity, in terms of foot-pounds per second, horsepower and / or kilowatts.

The vital importance of Thrusters to this concept will be explored and explained more precisely and comprehensively in subsequent chapters of this work. Suffice to state, for the purposes of this Chapter One, that their normal function forces them to borrow significant numbers of pneumatic particles , at a constant rate, from the Pneumatic Mass within the Rotor Assembly. This tends to reduce the earth gravity weight of the Mass, which must remain constant if the pressure differential across Thrusters is to remain constant. For this reason, every particle borrowed by the Thrusters, from the Mass outer surface , must be replaced instantly by a particle added to Mass inner surface. This is the sole reason for the particles replacement and recycle transfer system of the Inertial-Pneumatic Electric Power Concept.

Eventually, our recycling particles pass through the small .094 inch diameter opening of one of the two Thrusters through which they will be ejected from the Rotor Assembly and into the Environmental Control

Vessel by the same pressure differential that produces the thrust. They probably will remain idle there for a while , under the lower but constant Rotor Environmental Pressure , moving around the Vessel interior under the influence of air currents , but sooner or later they will leave the Vessel through one of the two transfer lines from Vessel to Pneumatic Controls. They will pass through Pneumatic Controls and on through one of two transfer lines from Pneumatic Controls to Rotor Assembly bore entrances from whence they started, passing back through Vessel walls on the way. Their first recycle journey is now complete and the length of the recycle transfer loop has been no more than 144 inches or 12 feet.

Reviewing the similarities and differences contained in the analogy of Hydro-Electric versus Inertial-Pneumatic Electric systems, they are similar because both utilize a free natural force as energy source and fluid pressurizer. They are different because Hydro-Electric utilizes the natural, but relatively low, pressurizing energy of earth gravity, while Inertial-Pneumatic Electric utilizes the natural, but very high, pressurizing energy of inertia , in its centrifugal force function , to generate internally a very powerful artificial gravity. They are similar because they both utilize a fluid medium for their energy conversion processes. They are different because Hydro-Electric utilizes enormous volumes of non-compressible and high density water as fluid medium while Inertial-Pneumatic Electric utilizes very minute volumes of compressible and much lower density air as fluid medium. The air fluid medium is low in density compared to that of water but high in density compared to that of standard air , such as a person would breathe at a sea level location.

They are similar because both utilize a fluid recycle system to

perpetuate their operational modes. They are different because Hydro-Electric utilizes the external, and very large, natural rainfall loop, with earth gravity sustaining flow, as its fluid recycle transfer system while Inertial-Pneumatic Electric utilizes an internal, and very small, mechanical conduit loop, with strong artificial gravity sustaining flow, as its fluid recycle transfer system.

They are similar because both convert fluid pressure to rotational power. They are different because Hydro-Electric converts low level but large volume hydraulic, (water), pressure to tangentially directed rotational thrust, via appropriately designed hydraulic turbine blades, large in magnitude but low in velocity while Inertial-Pneumatic Electric converts high level but small volume pneumatic pressure to tangentially directed rotational thrust, via appropriately designed Thrusters, small in magnitude but high in velocity.

They are similar because both convert rotational power to electric power. They are different because Hydro-Electric usually attaches electric generators directly to turbine shaft and the generator rotors are very large in diameter and they rotate at the same low RPM as the turbines while Inertial-Pneumatic Electric operates its pneumatic turbine, the Rotor Assembly, at very high RPM, delivering its generator drive power through a speed reducing gear power train from turbine to generator.

They are similar because, once their operational modes have been established, both deliver electric power perpetually without fuel costs and without environmental pollution. They are different because Hydro-Electric usually requires enormous capital and material investment for initial system installation while Inertial-Pneumatic

Electric requires comparatively small capital and material investment for initial system installation. They are also different because Hydro-Electric is exclusively stationary in a permanently fixed location usually in a remote area requiring long, dangerous and expensive high power lines, vulnerable to natural and man-made damage, to deliver its electric power while Inertial-Pneumatic Electric can be either stationary or mobile and can deliver its electric power on consumer site or from nearby central station via short, low-cost and safe, under-ground cable.

They are also different because Hydro-Electric is limited in its maximum productive capacity by the necessity to maintain the dam water-out level at or below the water-in level if uniform production is to be maintained while Inertial-Pneumatic Electric is limited in its productive capacity only by design specifications, since it has its own captive and appropriate supply of energy conversion fluid medium.

They are similar because both are very effective substitutes for the environmental polluting, expensive and politically troublesome fossil fuels as well as for the threatening and politically dangerous atomic energy. They are different because Hydro-Electric now provides approximately one-third of consumer electric power requirements in these United States but this probably comprises its practical productive limit for lack of available new installations, while Inertial-Pneumatic Electric has no such limit and is capable of assuming all contemporary and future consumer demand for electric power, including that now supplied by Hydro-Electric facilities.

Another excellent analogy can be drawn between the Inertial-Pneumatic Electric Power System and a Shuttle Craft Orbital System, in their

respective start-up, operational and shut-down modes, which lend credence to concept feasibility, since both systems utilize the same natural energy source, inertia, in their perpetual operational modes. They are similar because the objectives of their respective start-up modes are to establish operational orbital or rotational velocity, operational orbital or rotational radius to center of gravity and operational critical time period (t).

They are different because preparations for initiation of start-up for Shuttle Craft means launch rocket assemblies, with payload attached and fully fueled, are in position on the launch ramp, ready for initiation of count-down to initiation of start-up mode, while preparations for initiation of start-up mode for Inertial-Pneumatic Electric means that the Environmental Control Vessel has been fully charged with the appropriate Rotor Assembly environmental pneumatic pressure, Pneumatic Storage contains sufficient high pressure external start-up pneumatic supply and the system Program Control computer has been fully programmed and is awaiting signal from the operator on duty to execute the start-up section of its over all program.

They are similar because both systems' start-up programs are computer controlled, from start to finish, with operators standing by only for emergency contingencies. They are different because the Shuttle Craft start-up program begins with rocket fuel ignition and lift-off from the launch ramp. Vast quantities of rocket fuel energy must be expended during the start-up program because the initial load includes the great weight of the fuel itself and its disposable containers, even though the start-up burn is usually less than ten minutes. Burn termination and the payload coasting into orbit operational position, terminates the Shuttle Craft start-up program. It also terminates external energy

contributions to the Shuttle Craft Orbital System.

They are also different because the Inertial-Pneumatic Electric start-up program begins with the routing of external start-up pneumatic supply from Pneumatic Storage to Rotor Assembly entrances, sufficiently high in pressure for adequate pressure differential across Thrusters to very quickly accelerate Rotor Assembly and Pneumatic Mass RPM to levels where sufficient inertial-pneumatic compression is developed internally to complete acceleration to operational orbital or rotational velocity. A very small quantity of external high pressure pneumatic supply from Pneumatic Storage is normally required for the start-up program, usually less than sixty standard cubic feet for a two-thruster system, and a portion of that is normally returned to Pneumatic Storage in the form of excess environmental pneumatic pressure. The transfer of external pneumatic supply usually requires less than five seconds and the entire start-up program is normally executed in less than ten seconds. Termination of the start-up program also terminates external energy injection into the system's perpetual operational mode, exactly as it does in the Shuttle Craft start-up program.

In the operational mode, the two systems are similar because they both utilize inertia, in its centrifugal force function, as their free natural energy source and prime mover. They are different, in the operational mode, because the Shuttle Craft Orbital System incorporates only one energy conversion, inertia, in the centrifugal force function, to earth gravity neutralization, with one-hundred per cent efficiency, while Inertial-Pneumatic Electric incorporates three energy conversions, inertia, in its centrifugal force function, to pneumatic pressure, with 95% efficiency, pneumatic pressure to rotational thrust power, with 26% efficiency, and rotational thrust power to electric power, with

46% efficiency, for an over all system efficiency of 12% .

The operational modes of the two systems are similar in that they are perpetual, requiring no external forms of energy to sustain the mode. They are different because Shuttle Craft encounters zero resistance to its orbital forward motion so that inertia, in its forward motion function, alone sustains constant orbital velocity and critical time period (t) , precisely and perpetually, while Inertial-Pneumatic Electric encounters significant resistance to rotational forward motion, most of it in the form of replacement particles' inertia resisting acceleration and the remaining very small percent of it in the form of friction in the Rotor Assembly suspension system.

The power to overcome these impediments to Rotor Assembly rotation must be provided by , and subtracted from, the available rotational thrust power. This leaves a significantly reduced amount of rotational thrust power available as generator drive power and an additional 10% of that may be consumed by losses in the power train and generator assemblies. This accounts for the low over all system efficiency. However, this is effectively compensated by the prolific productive capacity of inertial-pneumatic compression. It perpetually provides enormous amounts of pneumatic pressure power to the Thrusters, sufficient to satisfy their voracious and very wasteful appetites. The end result and bottom line is a very high electric power productivity, for the size of the system, at zero fuel cost and with zero environmental pollution.

In the shut-down mode, the two systems are similar because they both interrupt the perpetual operation by reducing, or eliminating, their source of energy, inertia , in its centrifugal force function. They differ because the Shuttle Craft Orbital System injects a resistance to

orbital forward motion , in the form of thrust from small control rockets or jets, in a direction precisely opposite to the orbital forward motion, so as to reduce inertia , in its centrifugal force function, by reducing orbital forward velocity and thereby increasing the critical time period (t). A precisely planned and computer controlled orbital decay begins immediately and the decay is assisted along the way by the added resistance to forward motion of closely controlled passage through the earth's atmosphere, where high velocity impact with pneumatic particles produces very high level heat that must be absorbed by a specially designed heat shield to prevent severe heat damage to internal personnel and equipment. The shut-down mode of the Shuttle Craft Orbital System concludes with a carefully planned and controlled glide on its glider wings through the lower atmosphere to its mission terminating landing strip, usually in California but occasionally in Florida.

The Inertial-Pneumatic Electric shut-down mode differs, in that it initiates the mode by totally interrupting the flow of replacement pneumatic particles into the two entrances of the Rotor Assembly. This permits the two Thrusters to totally deplete the constant level of pneumatic particles in the Pneumatic Mass within the Rotor Assembly, and thereby reduce its earth gravity weight to zero. This also reduces inertia, in its centrifugal force function, and inertial-pneumatic compression to zero, as well. The shut-down mode is terminated as the Rotor Assembly , under full Programmer control, is allowed to coast freely for perhaps ten minutes down to zero RPM. Through out the operational mode, the Program Controller has been governing Rotor Assembly RPM at precisely the specified operational level by adjusting electrical load on the Generator Assembly so as to totally consume the



generator drive power delivered by the Rotor Assembly to the power train between Rotor Assembly and Generator Assembly, or Assemblies. It is entirely possible that the Program Controller may have been programmed to shorten the coast down time, during system shut-down mode, by retaining at least part of the electrical load on the Generator to act as a brake on the Rotor Assembly coast down.

Chapter One of this work has endeavored to transfer to the reader some sense of comprehension concerning the reason for the title being "Inertial-Pneumatic Electric Power Concept", the general principles of its operational functions and the probable impact that the successfully developed and mass produced systems will have on both contemporary and future societies and their ways of life, if positive action is undertaken in the immediate future of the early 1990's. Subsequent chapters of this work will present conclusive supportive evidence that the impressions conveyed by Chapter One are soundly based in physical and mathematical fact and extensive experience in machine design, development, production and application. Be advised, however, that no amount of authentic supportive evidence will be convincing without full comprehension of the origin of centrifugal force, which this work contends, and believes it has proven, is actually inertia in its most common function. Chapter Two of this work addresses this vital subject in precisely accurate and comprehensive detail. It is believed to be an explanation of this important natural function which will transfer to the reader full comprehension of what it really is and how it is generated. The reader is expected to find that this definition fits the perpetual nature of orbital systems, the precise balance of the universe and the pertinent laws of fundamental physics better than any other prior definition to which the reader may have been exposed.