

WEATHER MODIFICATION SYSTEM

COMPLEX OF MEANS AND TECHNOLOGY FOR DESIGN AND MODIFICATION OF THE ATMOSPHERIC SITUATION ON A GIVEN TERRITORY

Advanced Synoptic Technologies company is engaged in theoretic development, manufacture and subsequent practical employment of state-of-the-art technologies for local influence on atmospheric processes in the professional services market segment.

The system of influencing the atmospheric process has been developed around the idea of a rational product that meets the requirements imposed on the advanced technologies in this area:

- urgent need
- environmental safety
- optimal power consumption
- high cost effectiveness
- fast deployment and commissioning
- reliability, flexibility and simple in use

With the above principles in mind, the experts of the ASTech Company have developed a theoretical basis and the equipment which constitute the complex of means for modification of the atmospheric situation on a given territory. This complex of means is referred to as the ***Influence on the Local Atmospheric Processes (ILAP) Technology***.

Relevance of ILAP Technology

Statistics collected by scientists lead us to conclude that weather and climate have a considerable effect upon economics and social processes in human society. Indexes of effectiveness in many industrial branches, in agro industrial sector and in business depend directly upon climatic conditions in any region of the globe. Just some examples:

- One time-out day of an international airport due to adverse weather situation and, consequently, limitation or prohibition as regards take-off and landing will result in an aggregate loss amounting to several hundred of thousands of USD.
- In many countries, the swing in harvest because of weather runs up to and even exceeds 30%. Weather changes also badly affect the cultivated crops quality.
- The unreasoned and destructive human activity in conjunction with heavy weather conditions figures in some cases as a “natural catalytic agent” to impair a local ecological situation. This is the cause of such processes as, for instance, drought and soil mineralization which, in its turn, may account for irrecoverable loss of flora and fauna of the problem region.
- Issues of the day remain drought-affected and fire-risk areas, fogs control in seaport zones, on motor roads and railways, deterioration of ecological situation in cities due to gas contamination and harmful substances in the air.

Obviously, the technology capable of many of the above challenges in the shortest possible time and at relatively low costs will be greatly demanded by business and society.

Purpose and Fields of Application

Based on results of long-term investigation of atmospheric process algorithms, and on theoretical footing of the system for controlling atmospheric situation on a given territory, one should define basic lines of what the equipment is designed for and where it may be used.

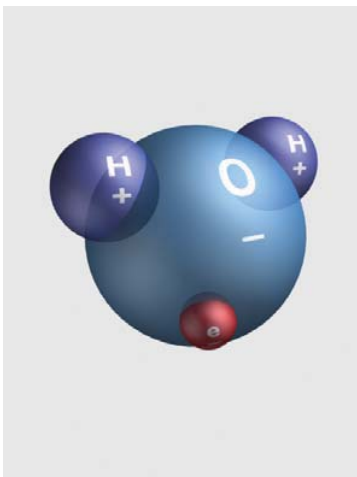
Purpose

- Inducement of **atmospheric precipitation** in relevant regions.
- Increase of **atmospheric precipitation** intensity.
- Destruction of **cloudiness** (creation of fine sunny weather).
- Destruction of **fog** and its prevention.
- Elimination of **smog** in cities, open industrial installations, open pit mines etc.

Fields of Application

- **Agriculture** (prevention of hail, timely watering, termination or reduction of precipitation in time of harvesting).
- **Water supply** for cities, regions (retention or increase of the required level in water-storage reservoirs or water scoops).
- **Aviation** and **marine navigation** (upkeep of the required visibility ranges and cloud base).
- **Forest fire fighting** (inducement of atmospheric precipitation or increase of its intensity).
- **Social and sporting events, festivals, air shows** etc. (destruction of cloudiness and creation of fine weather).
- **Environmental protection support** (soil salinization and soil drought prevention or reduction)

Influence on the Local Atmospheric Processes Technology



The key element on which our technology is based are the negative ions. **Ion** (Greek, present participle of *ienai*, “to go”) is an electrically charged atom or group of atoms the electrical charge of which results when a neutral atom or group of atoms loses or gains one or more electrons (or other electrically charged particles). The loss of electrons results in a positively charged atom, and the gain of electrons in a negatively charged atom. Atoms (as well as molecules) acquired an electric charge are called “ions”.

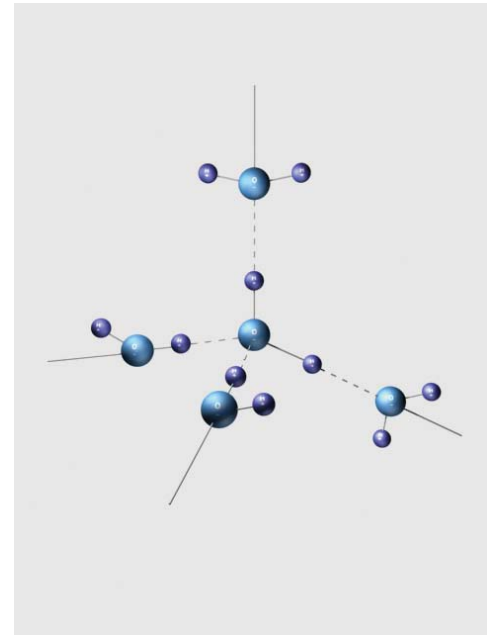
The natural environment contains both positive (hydrogenic) and negative (oxygenic) ions. Ions with different polarity are attracting to each other attempting to create an electrically neutral compound.

The negative ions are used widely in medicine and home appliances due to their electrophysical properties. These appliances include home ionizers, air conditioners, split systems, moisturizers, etc.

Along with these applications, from the middle of the past century investigations had been started to analyze the abilities of negative ions to impact on the atmospheric processes.

This problem has been investigated by many researchers belonging to various scientific schools, in different directions:

- radioactive ionizing materials usage (radionuclide tablets);
- hydroionization (water microdrops spraying);
- high radiofrequencies or UV-emission usage (disadvantages are high power consumption and unhandiness of the equipment used);
- brush (or "glow") discharge or "quite" corona effect usage (benefits include low power consumption and portability with no ionization byproducts generated).



Our company chose to develop the corona ionizers as this is the most effective and safe method to produce the vital part of the technology, light negative oxygen ions.

As the result of the research conducted, we created the ***Influence on the Local Atmospheric Processes (ILAP) Technology***.

This technology is based on the method of electrical air ionization with the emission of **electrons** (negatively charged oxygen ions) created by **ion generators** (ionizers). Ionizer is the device with three compact-assembled electrodes. One electrode (emitter) carries the corona element. When high voltage (from **10** to **32 kV**) is supplied to the ionizer emitter, the emission of electrons to the atmosphere occurs.

Electrons couple with neutral molecules which results in negative molecular ions. These molecular ions become centers around which neutral molecules are grouped.

In the natural air environment, electrons are mostly coupled by the neutral molecules of water causing generation of tiny drops. The water molecule is involved in this process due to its electric polarization as distinct from hydrogen and oxygen molecules in the air.

When water molecules are coupled, the thermal power emission occurs, which results in higher air temperature. The permanent emission of electrons from the ion generator causes permanent air heating, resulting in the stable upward air stream. This upward air stream carries a great amount of atmospheric moisture.

On the way to the upper atmosphere, the air is cooling. The atmospheric moisture is condensed, creating clouds or intensifying already existing ones so that precipitation occurs.

The upward air streams cause the compensating downward air streams that enforce dissipation of clouds and fogs. The upward air stream height and intensity are adjusted according to the current tasks by setting up the ion generator working mode parameters.

The upward or downward air stream is generated according to the specific tasks for the territory being handled. In such a way, it is possible to provide contrary effects when needed: to enforce precipitation or to dissipate clouds and fogs.

The principles on which this new technology is based enable on demand control over atmospheric precipitation, fog dissipation and effective improvement of urban ecology as a result of air pollution level being decreased.

When creating this technology, its authors have also used special know-how eliminating any danger to the human health and ecology. The automatic control of the ionizer working mode parameters prevents ion and ozone overproduction, and the adjusted voltage level excludes generation of toxic components.

As a whole, we may proudly say that the **ILAP** technology is designed to take care of both nature and human beings.

Equipment

The technology of influencing the atmospheric processes is based on the principle of transforming meteorological formations by creation of convection air flows in the atmosphere using the electric field of ionic generators.

The principle of influence implies only a local influence on atmospheric processes on a territory from **100 to 500 sq. km.** Upon switching-off, the weather acquires its natural character, as typical for the given area.

The hardware comprises stationary and mobile influence means and operational control equipment to be positioned on the relevant territory as per layout agreed upon with the Customer. The arrangement layout is to be elaborated considering statistical climatic data on the region, service zones dimensions, terrain nature, available water reservoirs etc.

One complex includes **3-5 units** used both in stationary and in mobile modes, combined by one remote control post. A means of influence is composed of a compact ionic generator with dimensions **1.5 × 1.5 × 2 m**, a multi-purpose power supply unit operating from **220-240V** mains or from battery **12-24V** (including a motor-car cigarette lighter), and a control unit with software. The consumed power for one complex is not in excess of **1.0 kW/h.**

In case of long-term deployment, the equipment may be complemented by direct and return communication facilities (radio set and modem) to enable a remote control and to monitor the parameters. Additional outfit may also include necessary meteorological devices and video systems to provide visual observation at the spot of influence means position.

The equipment is easy to use and can be quickly deployed at the specified site.

This electric method of active influence poses no danger for human health and environment. Checkout measurements have shown that the ionic generator electromagnetic emission level does not exceed natural values within **20 m** radius from the equipment position point.

Required Data, Meteorological Information Availability and Specifications

1. Required Data:

- basic local climatic conditions (winter, spring, summer and autumn durations and pressure, humidity, temperature and wind parameters);
- statistical precipitation quantity (snow and rain with monthly breakdown);
- statistical quantity and routes of low pressure regions (cyclones) above the local area;
- statistical data on the frequency and duration of quasi-stationary anticyclones (a quasi-stationary anticyclone is a high pressure region retained above a local area for a long time);
- local orographic data (presence of hills and plain lands);
- geographical location of water reservoirs and natural water supplies (rivers supplying water to the water reservoirs);
- predominant air flow directions and the wind rose;
- Mark areas for works on the map.

2. Meteorological Information Availability:

- meteorological radar data;
- altitude probing data (temperature, humidity, pressure and wind speed and direction with altitude breakdown);
- long-term prediction for the period of the works;
- precipitation prediction;
- mist formation prediction;
- ordinary online meteorological information (additional scope of data to be determined taking into account local capabilities);
- isobaric maps (surface map, 850 mBar, 700 mBar, 500 mBar, 400 mBar, 200 mBar, AT 500/1000 mBar);
- Low pressure region movement prediction (cyclones, typhoons and hurricanes).

3. Specifications:

- space required for assembly and installation of one ionic generator: **5 m × 5 m**;
- ionic generator locations will be determined on site depending on landscape, local meteorological conditions and the work schedule approved;
- fencing and guarding of the ionic generator and necessary equipment locations;
- power supply: **AC 200-240 V, 50/60 Hz**, or **DC 12-24 V**; power consumption of one ionic generator: **200 W**;
- availability of a service room for the installation of direct communication, feedback and ionic generator operation parameter control and monitoring hardware set;
- the area shall be within mobile communication coverage;
- Vehicles for equipment and personnel transportation.

All Rights Reserved

Technology and complex of means are protected by the relevant Russian patent for invention **№ 2233578**: “**Method of disturbance of anticyclones circulation and arrangement for its implementation**” and possesses a priority application for international patent **PCT/RU2004.000269**.