

3. Wolfgang Rice. The device and principles of operation analog-to-digital converters of various types of WBC GmbH // Components and technologies № 3 2005.

## WATER TREATMENT PLANT “IMPULSE”

*Loskutova A.M., Nesterov V.V.*

*Tomsk Polytechnic University, Tomsk*

*Scientific supervisor: Kosheleva E.Y. PhD in History, associate professor,  
Department of Foreign Languages, Institute of physics and technology*

One of the most important problems in our days is lack of clean drinking water.

TPU scientists have developed water treatment plant “Impulse”. It is using electro impulse processing of water and filtration with mechanic filters for water purifying. Mechanical filters fit with chip natural materials. Electro impulse processing of water founded on the combined action of the natural oxidants (ozone, radicals, OH, and atomic oxygen etc.). This reproduced the phenomena occurring in nature during a thunderstorm, and preserves the natural properties of water.

The unit discharge of water treatment is a "wet ozonator" placed directly in the aerated water flow. It allows easier purification scheme and leads to reducing the cost of equipment.

Using the all positive factors that accompany discharge (short-active particles, ozone, ultraviolet light, electric field, etc.) made it possible to significantly reduce power consumption and significantly increase the processing efficiency.

The water treatment plant “Impulse” is able to remove metals (Fe, Mg, Pb, Cu, etc.) out of water.

Compared with other water treatment plants, “Impulse” has some significant advantages. Benefits:

- Low power consumption (50 W h / m<sup>3</sup>) at a high efficiency water treatment through the use of the original treatment technologies;
- no chemicals and consumables;
- simplicity and reliability in operation and maintenance;
- environmental safety;
- high quality-price ratio;
- payoff is 0.5-2.5 years;
- the cost of 1 m<sup>3</sup> of water is chip(0.3 \$).

## References

1. Журба М.Г., Вдовин Ю.И., Говорова Ж.М. Водозаборные очистные сооружения и устройства. М., «Астрель», 2003.

2. Водочистой комплекс «Импульс» // Электронный ресурс. Режим доступа: <http://www.impulse.tom.ru/impulse.html>

## EVALUATION OF THE EFFECTIVENESS OF PUBLIC ANNOUNCEMENT MEANS TO PREVENT EMERGENCY

*Mazhanov M.O., Skvortsova S.S.*

*Tomsk Polytechnic University, Tomsk*

*Scientific supervisor M.V. Kuimova, PhD in Methods of TFL, Associate Professor of TPU*

Nowadays, we face a number of challenges: fires, floods, earthquakes; traffic accidents, collapse of buildings and terrorism. Almost all emergencies lead to panic and further loss of life and property. In Tomsk region there are two nuclear hazardous objects, one chemically dangerous object and two hydrotechnical constructions. That is why the prevention of emergency situations is important.

Together with Oleg Sergeyeovich Kaymonov, lieutenant-colonel, head of the department of information technology, automated control systems and communications in Tomsk, we chose to research five public announcement means: street loud-speakers; SMS notification; stands in educational, administrative buildings and outdoors; prevention talks in educational institutions and enterprises; radio and TV broadcasting.

1) **Loudspeakers.** Loudspeaker is an electro-acoustic or mechanical device for a loud sound. In Russia, radio broadcasting is rather widespread and used practically in all cities and villages. This extensive network creates favorable conditions for population warning in case of emergencies, ensures quick information and announcement how to behave in emergency circumstances.

2) **SMS.** Russians are informed about emergency via SMS not for the first year. Megaphone was a pioneer in cooperation with the Ministry of Emergency Situations of Russia. In autumn 2014, this operator was the only one with the technical ability to carry out selective transmission to regions [1].

3) **Stands.** Stands for civil defense and emergencies represent meaningful and accurate information. The information on the stands must be