5. Brykov S.I., Banyuk G.F., Trunov N.B., Y.V. Kharitonov, Susakin S.N., N.N. Davidenko The role of water chemistry in resource management VVER steam generators. Conference Proceedings VANO-IAEA. Optimization of operation GHG Nuclear Plants, Kuznetsovs'k, 11-14 June 2002.

6. Titov, V.F. Expert Meeting IAEA WWER steam generators. Nuclear energy, 1997, t.83, vol. 1, pp. 74-75.

7. S.A. Logvinov et al. Thermohydraulics of PGV-4 Water Volume During Damage of the Feedwater Collector Nozzles Proceedings of third international seminar on horizontal steam generators. Lappeenranta, Finland. 1995. p.p. 33-48.

8. Trunov N.B. and others. The past and the future horizontal steam generators. FSUE OKB "Hydropress", Podolsk.

FORMATION OF HIGH POWER MICROWAVE PULSES WITH ADJUSTABLE PARAMETERS IN RF COMPRESSION SYSTEMS

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Presented the results of theoretical and experimental studies of the formation of microwave pulses with the adjustable power, duration, repetition rate and the envelope form during energy output from the cavity by controlled transformation of the oscillation mode at the waveguide stub coupling aperture [1]. Pulse parameters are changed by adjustable elements of the coupling of modes, which directly affect to the coefficient of the coupling of modes *h*. In this work the possibility to form a series of subnanosecond duration MW pulses at a fractional energy output and nanosecond pulses of various lengths at a single complete output of high frequency energy from the compressor cavity are demonstrated. The shape of the pulses is calculated through the recurrence relations between the amplitudes of waves in the system, the relations between which have been recorded according to the scattering matrix method.

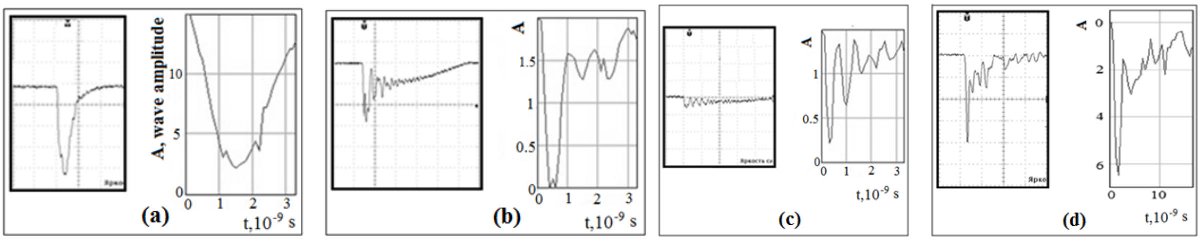

Figure 1. Comparative analysis of the calculated and experimental output pulse envelopes at h = 0.9 and a different electrical length of the stub φ: a) φ = 0; b) φ = 1; c) φ = 2; d) subnanosecond length pulse, h = 0.9, φ = 0. Time scanning in the oscillograms is 10ns per division.

Figures 1a-1d show comparative analyses of the calculated and experimental output pulse envelopes generated in the compressor with the coefficient of the coupling of modes h = 0.9 and the electrical length of the stub φ variable within the range 0 .. π. Fig. 1d shows the possibility of formation of subnanosecond duration MW pulses by applying the studied method. Using the coupling element stack, we therefore can generate a series of pulses with a high repetition rate in the range of the excitation pulse. Pulses with a duration of 8-10 nanoseconds, working frequency 9.248 GHz, were obtained by experiment in the X-band MW pulse compressor. The gain of this compressor is 8-9 dB.

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REFERENCES

1. Igumnov V., Avgustinovich V., Artemenko S., Novikov S., Yushkov Yu.. Formation of Pulses with Controlled Parameters in a Resonance Microwave Compressor Employing Oscillation Mode Transformation // Technical Physics Letters, 2013, Vol.39, №9, pp. 755-757.

WIND GENERATORS

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A wind turbine is a popular name for a device that converts kinetic energy from the wind into electrical power. Technically there is no turbine used in the design but the term appears to have migrated from parallel hydroelectric technology. The correct description for this type of machine would be aerofoil-powered generator.

Strictly speaking wind generator can be made from a few magnets, coils of wire and a piece of plywood for the blades. Fully working wind generator will not do without the following components:

- The rotor; blades; wind turbine; tail, orienting the rotor against the wind
- Generator
- The mast with stretch marks
- Charge controller
- Batteries
- Inverter

$$P = 0.5 \cdot \xi \cdot S \cdot \upsilon^3 \cdot \rho \cdot \eta_{ред} \cdot \eta_{ген}$$

For a rough calculation of wind turbine power different formulas can be used but it is better to use the following: here ξ - is the coefficient of wind use (WEUC) , S - working area of the wind turbine, υ - the speed of the incoming flow, ρ - flux density, η_{gm} - the efficiency of the gear unit / multiplier, η_{gen} - the efficiency of the generator.

In calculations it is necessary to take into account different WEUC values for different types of generators. Vertical wind turbine WEUC can reach about 0.4-0.5, and it does not exceed 0.3 for wind turbines with a horizontal rotation axis.

The obtained electrical energy is not ready to use yet: recorded directly from the generator electric energy will vary depending on the wind speed. To make a usable energy it is necessary to accumulate energy so that it can be converted subsequently for certain tasks. To solve this problem the so-called "buffer", a battery that stores energy and a charge controller which is necessary for the proper battery charge is applied.

REFERENCES

1. Wind generator -- Wikipedia [Electronic resource]. – Access mode: https://en.wikipedia.org/wiki/Wind_turbine. – 23.04.15.
2. Wind generators [Electronic resource]. – Access mode: http://svetdv.ru/veter/index.shtml.