

Poltava-Kiev, Yelets-Kiev-Western Ukraine). The diameters of these gas pipelines are 500-1200 mm. the working pressure is 5.4 MPa. In 80th years all main gas pipelines were built – jumper (Bogorodchany – Dolina, Shebelinka – Slavyansk, Ananiev – Bogorodchany).

Gas turbine units are one of the main elements of the GTS. The first GTU's for the KS drive were stationary.

They had a high metal capacity of low efficiency – no more than 28%, requiring a significant amount of work for installation and debugging.

The main disadvantages of these GTE's are:

1. Time on failure only 1 – 3 thousand hours.
2. Short service life – 50 – 60 thousand hours.
3. Small overhaul life – 10 – 20 thousand hours.

Today the STS of Ukraine has two main technical problems:

1. 70% of GPU's have practically worked out the resource (100 thousand hours and foreign analogues – more than 150 thousand hours) and is subject to scheduled replacement of 136 GTP.

2. Low efficiency – 18 – 25% of GTU. Foreign analogues – 34 – 38%.

In order to improve existing and new GTRs it is possible to carry out research on the following main directions of GTU development:

1. Intensification of the working process by increasing the gas temperature in front of the turbine and the degree of air pressure increase in the compressor with optimization of the cycle parameters.

2. Optimization of GTE design by specific gravity and reliability index.

3. Application of new heat-resistant and light materials, as well as high-tech processes in the production of engines.

4. Development of fundamentally new engine designs with a significant improvement in fuel economy and environmental performance for harmful emissions and noise.

5. The introduction of effective means of monitoring the technical condition and improving the methods of their operation to ensure an appropriate level of reliability and minimize operating costs.

6. The use of microprocessor technology in the automated control systems for gas turbine engines to expand the range of stable operation of engine components and optimize the operating conditions with fuel consumption.

7. Carrying out new energy-intensive and ecological fuels.

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## **THE DEVELOPMENT OF ARTIFICIAL INTELLIGENCE IN GAMES**

Artificial Intelligence (AI) has been used in many fields of our lives, but not many people know about using it in field of gaming industry. It's clear that video games were

born without artificial intelligence. In early years video games mostly were mostly created for playing between real people. Even first video game was called “Tennis for two”. But, if you have ever played nowadays games, you can find some elements controlled by artificial intelligence. But do you know how artificial intelligence developed.

First video arcade game, “Computer Space”, was released in 1970 by Atari. From this moment, the first stage of the development of artificial intelligence begins. Game designers began to take their first attempt to incorporate AI into their games. While you are playing the game, artificial intelligence controls the actions of enemies, when they hide and when they shoot in player. But they don't respond in right way when player stays on one place or even run in converse way, they just wait player in scripted position on map. So, as you can see, game machine was managing under very simple rules and scripted actions. Computer didn't have capability to answer on player's activities.

To make computer more unpredictable, game designers made their decisions randomly. What does it mean? All possible activities were actually coded into the game. But, they were not able to act at runtime. It means that sometimes player can spectate different actions that have no meaning. Of course, it didn't improve game play.

To make the game more realistic a new type of AI in the form of saved templates appeared. First game of this generation was “Space Invaders”. In this game, player must shoot the aliens before they reach the bottom of the screen. The way these aliens move is pre-coded into the game.

Many games were created with this type of AI, but next stage of development sets new goals. New types of games were simulators of real games. The appearance of plausible behavior made people believe that computer was thinking. The main feature that made it possible is necessity to make decisions based on the actions of human players. Artificial Intelligence appears in its canonical form.

With the development of computer abilities new games became more complex. In game industry a new type of games appeared– real-time strategy or RTS. Main feature was highly competent and wisdom of AI in game situations. The most common RTS in the 1990s was chess simulator “Deep Blue”. The computer uses the built-in algorithmic tree for calculating all possible moves on board, then calculate human moves. After, AI compares these results and choose the most suitable move. A similar algorithm has also been applied in many strategy games. For the next 20 years, Artificial Intelligence has improved and expanded its capabilities.

Due to all of the processes described above it became possible to create a new generation of games with build-in AI. So-called open-world games allow designers to fully realize all the power of AI. For example, in one of the most memorable open-world game “Grand Theft Auto” or just “GTA” it is suggested to play in a simulator of city. In this game you can go anywhere you want and do anything you want. Of course, throughout the city you will meet the “citizens” or, more correctly, non-player characters (NPCs). The main task for designers was making believable interaction between NPCs and give them some humanity. As a result, a special set of reaction algorithms that manage NPCs was developed.

Another field of the development of AI in game is giving ability to learn. In most video games, NPCs' behavior patterns are programmed and they are incapable of learning anything from players, e.g. they don't evolve based on human players' input.

Today AI can compute almost infinite number of actions by the time. It allows creating really amazing game worlds with different characters and realistic interaction between them. We can only predict which level artificial intelligence will reach.

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## **OFFSHORE ZONES**

High taxes, tough tax laws encourage businesses to find various cost-cutting tools. One of these is offshore zones. The very term "offshore" appeared in the United States in 50s in one of the newspapers, it was one of the organizations that moved its activities to the territory with the best climate for taxation. From English, the word "offshore" has three meanings: "isolated", "in the open sea" and "off-shore", and all three of these values cannot best reflect such a concept as an offshore zone. Offshore zone is a special free economic zone, the feature of which is a simplified taxation system, or sometimes a zero tax rate on all or certain types of income, as well as a certain level of banking or commercial secrecy. That is, in some countries taxes are not levied on companies that operate outside their borders.

There are more than 50 offshore zones in the world. For the most part, these are small third-world countries in which the offshore services sector is a significant, and at times, the main source of income. Registration in such areas is fairly easy and annual payments will cost a few hundred dollars.

There are various types of offshore zones, in particular classical ones, when a non-resident company annually pays a state duty, without paying any taxes, that is, it pays only a fixed amount of money for the right to carry out its activities. In the classical offshore zones there is absolutely no provision for reporting to the authorities on the implementation of their activities. These offshore areas include: Belize, Seychelles and Virgin Islands, which are the exception, because in this free economic zone, you must fully report to the state on the activities of your company.

Offshore zones with low taxation, as it was Cyprus before, as well as countries that provide tax incentives for some activities, such as the United Kingdom, Hong Kong and New Zealand. In these offshore areas all companies must submit reports and pay taxes through a simplified system.

Offshore zones with a higher average taxation level are used to provide a high level of trust, companies registered in these legal areas are required to pay all taxes and receive reports.

The advantage of offshore zones is a favorable tax climate. Usually, offshore companies pay taxes, but do not pay income tax, VAT, or any social deductions at all, or levy taxes only on certain categories of profits, or they are lower than in the country where the company is a resident. It takes to register a company no more than 48 hours, accounting is simplified, there is no need to submit annual reports and you can invest