

**МІНІСТЕРСТВО ОСВІТИ І НАУКИ УКРАЇНИ  
СУМСЬКИЙ ДЕРЖАВНИЙ УНІВЕРСИТЕТ  
ФАКУЛЬТЕТ ІНОЗЕМНОЇ ФІЛОЛОГІЇ  
ТА СОЦІАЛЬНИХ КОМУНІКАЦІЙ**



# **СОЦІАЛЬНО-ГУМАНІТАРНІ АСПЕКТИ РОЗВИТКУ СУЧАСНОГО СУСПІЛЬСТВА**

**МАТЕРІАЛИ ВСЕУКРАЇНСЬКОЇ НАУКОВОЇ КОНФЕРЕНЦІЇ ВИКЛАДАЧІВ,  
АСПІРАНТІВ, СПІВРОБІТНИКІВ ТА СТУДЕНТІВ**

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addition, there are losses of magnetic energy in the electric motor gap and a magnet coupling.

Therefore, the most effective completely hermetic pump is the pump with a wet stator, because there is no can losses. So, this type of design is promising to create new hermetic pumps.

## **LAW ENFORCEMENT AGENCIES REFORMING IN TERMS OF PROVIDING STATE FINANCIAL AND ECONOMIC SECURITY**

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The economic and financial security of the state are indicators primarily showing the level of national security, that is, the state's ability to resist internal and external threats in the financial and economic spheres. However, today the situation in Ukraine is characterized not only with the high level of administrative and criminal offenses in the financial and economic spheres, that results in low level of economic and financial security of the state; but also with inability of existing law enforcement agencies aimed on identifying, investigating and terminating offenses in these spheres, to counteract the growth of the financial and economic crimes.

According to the Law of Ukraine "On state protection of court employees and law enforcement agencies" from 23.12.1993, the law enforcement agencies are organs of public prosecutor's office, internal affairs, security service, the Military Service of the Armed Forces of Ukraine, the National Anti-Corruption Bureau of Ukraine, agencies of state boundary guard, agencies of profit and collection, penal institutions, remand centers, agencies of state financial control, the state forest protection and other agencies engaged in law enforcement or having law enforcement functions.

It is necessary to mention about the new law enforcement agency – National Police of Ukraine, created by Verchovna Rada according to the Law "On the National Police of Ukraine" from 07.11.2015. So, National Police of Ukraine is the central executive agency ensuring the protection of rights and freedoms, combating crimes, maintaining public security and order in the society.

In accordance with the law “On amendments to certain legislative acts of Ukraine”, and the act of Ukraine “On the National Police of Ukraine" from 02.10.2015, the words “agencies of internal affairs” were replaced with the words “agencies of the National police”.

The subjects providing financial and economic security of the state are: agencies of the National Police, agencies of security service, agencies of state boundary guard, agencies of profits and collections (today it is State Fiscal Service of Ukraine) and agencies of state financial control. Irrespective of the amount of law enforcement agencies that have power to counteract and fight against financial and economic offenses, the level of financial and economic security of the state is very low, because authorities of these bodies are duplicated in the spheres of financial and economic security.

Unlike Ukraine, the states - members of European Union have plenary powers in sphere of state financial and economic security which belong only to a single law enforcement agency, that greatly increases its efficiency in the spheres of counteracting financial and economic offenses. Particularly in Italy and Romania, such powers are given to Financial Guards, administered by the Ministry of Economy and Finance of the States. In Macedonia, which is an official candidate to join the European Union, Bureau of Financial Investigations operates as the agency of the Ministry of Finance. To counteract and fight against this type of offenses in Austria, Financial Police is use. It is subordinated to the Ministry of Finance and combines the powers of border and tax agencies.

In our opinion, under conditions of integration of Ukraine to European Union, it is advisable to combine the powers, granted to the National Police, tax police departments, the Security Service and State Financial Inspection, and transfer them to a single law enforcement agency as to the subject providing financial and economic security of Ukraine. This law enforcement agency must operate on the basis of tax police as an agency that already has necessary financial, technical and human resources, and is subordinated to Ministry of Finance of Ukraine. This operation can be justified by the positive experience of European Union states, concerning the organization and activities of similar law enforcement

agencies, and the fact that Ministry of finance of Ukraine forms financial politics. So, considering the experience of European Union countries, today it is necessary to unite and pass all plenary powers of law enforcement agencies in the sphere of financial and economic security of the state to the single law-enforcement agency.

## **MODELING THE NON-EQUILIBRIUM EVOLUTIONARY THERMODYNAMICS OF FRAGMENTATION REGIME AT SEVERE PLASTIC DEFORMATION**

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Nowadays, metals are subjected to different forms of processing for obtaining the high mechanical properties (high strength and plasticity). This objective is achieved most cardinally at grinding the grain structure of metals due to their processing by the methods of severe plastic deformation (SPD).

At present, a special theory is being developed. It is based on the Landau theory concept of phase transitions. Within the framework of this theory, it is possible to explain many important features of the SPD process. However, these methods do not take into account the influence of fluctuation noise, which can critically change the nature of system evolution. Moreover, the connection between generations of several types of defects has not been revealed yet, for example, such defects as the grain boundary and dislocation. Their interaction can provide the stationary domains formation at the phase diagram.

The density of grain boundaries, dislocations and entropy are introduced for describing the defect structures. This allows us to take into account the two channels of energy dissipation (thermal one and defect formation). The phase diagram that establishes the domains of different