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INDUSTRIAL SAFETY AND OCCUPATIONAL PROTECTION STRATEGY

Cherepovets
2017

Industrial Safety and Occupational Protection Strategy

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1. Introduction

This section explains the logic of the Industrial Safety and Occupational Protection Strategy (hereinafter— the Strategy) and the structure of this document.

The strategy of the PhosAgro group of companies in the area of industrial safety and occupational protection (hereinafter—IS&OP) was developed by the Directorate for IS&OP of PhosAgro-Cherepovets JSC (hereinafter—the Company). The Strategy includes measures required to achieve one or more of the below-listed strategic goals of the Company in the area of IS&OP:

- Zero cases of lethal accidents among employees of the enterprises under management (hereinafter— ME), subsidiary and associate companies (hereinafter—DAC), and contractor agencies (hereinafter— CA);
- Zero breakdown and accidents;
- Long-term sustainable results.

These strategic goals were presented to the senior management of the Company during the in-person meeting of the Management Committee (hereinafter—MC) for IS&OP, in Kirovsk, on 8 December 2016, and were unanimously supported by the attendees. This list of strategic goals is manifest for any company doing business in sectors in which PhosAgro group operates.

When creating this Strategy, the Directorate for IS&OP relied upon the following information:

Analysis of work injuries that have taken place in recent years. This includes both quantitative and qualitative analysis of available data regarding work injuries from 2014 to 2016, and in some cases— since 2012. This type of analysis allowed them to determine certain priorities, both obvious and more subtle.

The need to further develop Project Dupont. As of the moment when this Strategy was under development, this project has already been in existence for at least two years with certain positive results. The senior management of the Company recognises the need to develop this project further and sets it as a goal for the Directorate for IS&OP. The Directorate for IS&OP recognises the importance of continuing to develop this project because, among other reasons, working within the framework of this project allows to use the vast administrative resource required to make considerable changes within the Company.

Opinions and suggestions of certain senior managers of the Company and individual enterprises. In particular, the opinion of the Technical Director of Apatit JSC regarding priorities in the provision of mining safety and the opinion of the Heads of IS&OP Departments of the enterprises in PhosAgro group of companies (hereinafter— the Group) regarding the most efficient practices and methods used in recent years that allowed to achieve good results in chemical companies, are considered quite valuable.

Target Programmes

PhosAgro is a vertically integrated structure where each stage has specific risks associated with it. In addition, certain risks apply to all stages. It is essential for the Company to determine major risks for each stage of the structure and each activity and introduce measures to mitigate such risks. This Strategy considers a complex of such measures as its Target Programme. At the moment, the Company is implementing and/or developing the following target programmes:

- Mining Safety (for Apatit JSC, its DAC, and CA);

- Transport Safety (for all enterprises of the Group);
- Contractor Safety (for all enterprises of the Group);
- Target Programme—Introduction of the 'Blocking—Marking—Control' system;
- Target Programme—Introduction of the 'Safety' information system.

There is a separate section for each of these Target Programmes in this Strategy.

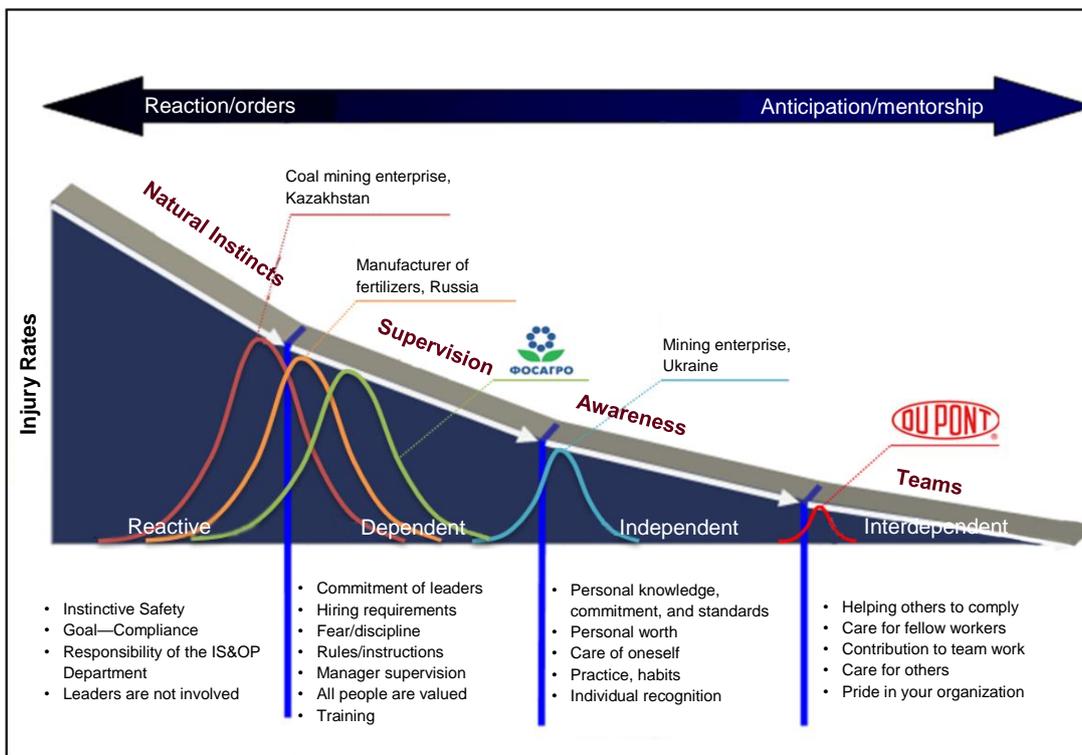
3. 'Enhancement of the Management System for Industrial Safety & Occupational Protection' Project (Project Dupont)

This project allowed for a number of significant changes and helped 'move mountains' in the area of IS&OP issues in the Company. It was agreed to focus first on introducing six priority processes listed in the table below. The Management Committee monitored the introduction of these processes at the level of the Company and individual enterprises thus giving senior management a mechanism to demonstrate their commitment to safety issues as one of the key values of the Company. This single achievement of the project has shown its success and the need to continue the work we started.

Project Details:

The project with the consultation subdivision of Dupont—Sustainable Solutions DuPont—was launched in April 2014. Stage 1 'Extended Audit' was implemented in May–June 2014, Stage 2 'Implementation' was carried out from July through November. The Extended Audit covered all four major enterprises of the Group, comprising 15,746 employees at the moment. The total cost of several contracts with the contractor was USD 2.7 mln.

Following the results of the Company's extended audit, Dupont experts ranked PhosAgro group of Companies at stage two on the Bradley Curve, with so-called 'dependent' safety culture.



The results of the extended audit also allowed for the creation of objectives, tasks, and main tools for the Implementation stage:

Objectives	Tasks	Areas
<ul style="list-style-type: none"> • Creating management tools for 5 priority areas. • Achieving 'quick wins' in lowering the risks and recurrence of incidents. • Formation of an internal team of change agents to extend to other sites. • Development of skills on efficient safety management for line managers. 	<ul style="list-style-type: none"> • Enhancing motivation and communication. • Enhancing the management system, introducing the best world practices. • Development of safety competencies and skills in the personnel. • Evaluation of Results. 	<ol style="list-style-type: none"> 1. Behavioural Audits. 2. Incident investigation. 3. Efficiency of individual safety gear. 4. Safety management for contractors. 5. Training. 6. KPIs and Motivation.

For the continuous development of Project DuPont, it is suggested that this project be continued as a project of the Directorate for Managing and Implementing Projects with Specified Objectives and Tasks and a Set of Initiatives.

It is also suggested that a scenario be considered in which Project DuPont is transformed into a project within the framework of this Strategy.

4. Leadership

The Company cannot achieve its IS&OP goals without all directors acknowledging their role in this work on all levels. Directors must be safety leaders, i.e. demonstrate, both in words and in practice, that industrial safety is one of the business priorities, and be able to mobilise their own resources and their employees' resources to identify and solve potential issues efficiently. The position, actions, and solutions of a director in the area of safety are a sign of leadership and serve as motivation for all subordinates.

It is important to bear in mind that a director can and must demonstrate leadership by personal example (use individual safety gear (hereinafter—ISG), participate in team meetings, etc.). However, the main form of demonstrating leadership is personal participation in preparing and implementing efficient management solutions in their area of responsibility.

In this respect, it is essential to ensure that managers of all levels, from senior to workshop managers, are involved in the process of providing industrial safety. Only when senior management is involved can changes begin. When managers of all other levels are involved, it means that the changes will be carried through and provide consistently positive results. Consequently, senior managers must not only show their leadership and commitment but also make sure that all lower managers can provide the same level of efficient leadership.

4.1. Senior Management

Senior management (top executive managers of the Company and enterprises as well as their direct subordinates) recognise the importance of the IS&OP issues and are ready to take the corresponding measures in terms of management. They demonstrate the commitment to the IS&OP policy, use tools to develop a safety culture as recommended by DuPont.

At the present time, the main task of the senior management is to project their conscious leadership to the lower level of the organization, i. e. to the leaders of the principal business units.

One of the possibilities for projecting leadership is for a senior manager to participate in the work of the Management Committee (hereinafter—MC) or the Committee of the enterprise (hereinafter— the Committee). The MC and Committees emerged in the PhosAgro group of companies as a component of the DuPont project for the development of safety culture. The MC mostly considers the results of the work of the

assigned team in the six areas suggested by DuPont. This approach is justified historically but limits the possibilities offered by the MC and Committees.

Suggestions on changing the goals and forms of the MC and Committees:

- Expand the range of issues subject to consideration by adding key issues of IS&OP in enterprises and the Company on the whole;
- Create profile subcommittees, such as mining safety, transport safety, etc.;
- Include executive managers of the principal business units as a minimum in the MC.

Another efficient way of demonstrating leadership and projecting your vision is for senior managers to organize Safety Visits. It is also a way of monitoring correct implementation of proposed initiatives on sites. Many large-scale companies are successfully using this practice. The procedure of the practice is as follows: the Director General of the Company and a few of his direct subordinates (e. g. managers of industrial departments) form an individual schedule of visits to the company workshops. As a rule, the visits are organized 1 or 2 times every quarter and can be scheduled to coincide with other visits to the enterprises. The key element is that the visits are regular and cover all enterprises, taking into account their size and the level of safety culture and injuries there.

Within the PhosAgro group of companies, such visits can be organized as a joint safety audit by a senior executive manager and a manager of a business unit.

It is suggested that Safety Visits be introduced as of H2 of 2017.

In addition, the senior management of the Company must remain aware of the latest trends in safety management used by their competitors and companies in other industries that are considered leaders in industrial safety. This goal can be achieved by attending industrial and cross-industrial conferences and forums with invited speakers and various companies.

It is suggested that 1 or 2 training seminars be introduced per year.

Conclusions: The following steps are suggested for senior management:

- Enhance the work of the MC and the Committees;
- Organize Safety Visits;
- Continue to learn about the world's best practices.

4.2. Middle Management

Middle management includes managers of the principal business units.

It is the next management and key (in terms of developing safety culture) category of personnel for the near future. Managers of this category are the link between senior management and immediate work supervisors. They set tasks for shopfloor supervisors, shop foremen, and through them—directly to workers.

4.3. Junior Management

Junior management includes shopfloor supervisors and shop foremen.

They are the next key category in the structure. They directly manage the workers, communicate with them, train them and set tasks, explain the procedures and safety measures related to the job. They are in charge of safety instructions and are constantly in touch with the workers.

5. Forming a conscious and responsible attitude to industrial safety and occupational protection among workers

The analysis of incidents in the last few years demonstrates that one of the fundamental causes of injuries in the Company is workers failing to comply with rules, norms, and regulations. Moreover, in most cases they were aware of the rules.

The reasons for their failure to comply were as follows:

- Lack of industrial training during career;
- Imperfect instructions given by the enterprise;
- Problematic training programmes and methods in training centres;
- Problems with on-site training and acquiring practical skills;
- Problematic system of monitoring correct implementation of established rules, limitations, and norms.

Detailed analysis of the situation:

1. Industrial training. Training programmes and methods in training centres:
 - The existing training systems in training centres do not demonstrate the real connection between rules and actual incidents, do not form a definitive logical chain from failure to comply with the rules to getting injured and subsequent suffering and loss for the team and the company;
 - Training methods do not form associations between theoretical and practical safety in the workers, thus failing to teach them to evaluate the actual industrial situation objectively, notice dangers in their work, and use safety measures (or follow safety rules) mindfully;
 - There is no feedback between the training centre and the business unit or enterprise that hires a worker trained in that centre.
2. Instructions at the Company's enterprises:
 - Instruction sessions are often a formality: workers sign the journal even though a session has not in fact been conducted; the information does not correspond to the topic of the session;
 - Engineering and technical staff (hereinafter—ETS) who conduct instruction sessions do not have teacher's skills;
 - They do not use modern and efficient ways of presenting educational material: slideshows, video and photos.
3. Internship and acquiring practical skills:
 - Internship can be a formality;
 - There is no concise list of competencies and skills that must be acquired during training;
 - Workers start working on their own after training without a consideration of their actual preparedness for work;
 - There is no system of mentorship for workers with less than two years of experience.
4. System of monitoring correct implementation of established rules, limitations, and norms:
 - In many BUs, BSAs are formal and do not allow to change workers' behaviour properly.

In order to improve the system of training, internships, mentorship, and behaviour control for workers, we suggest the following events:

1. Include information about real incidents which took place in the Company's enterprises in the programme of industrial training. This information can be presented during interactive practical classes where the student will have to identify the mistakes made by the people who caused the incidents and by other participants of the incident, determine the dangerous conditions corresponding to the incident, and suggest preventive and correcting measures. In general terms, we need to create a

system that will allow workers to learn on real incidents in order to avoid their recurrence on all sites of the Company.

2. Create a fund of animated movies, videos, and slide shows for industrial training and instruction sessions. Create guidelines for managers who conduct instruction sessions.
3. Make sure that executive managers and experts of business units, experts in fire safety and occupational safety, other profile specialists, take part in creating programmes of industrial training.
4. Include experts of business units, experts in fire safety and occupational safety, and other profile specialists in the certification committees of the institutions of further professional education.
5. Teach experts of BUs, experts in fire safety and occupational safety the following:
 - Methods of training for adults;
 - Establishing a dialogue between a teacher and students;
 - Skill of organizing a group discussion about certain dangerous situations and cases of incidents.
6. Revise, update, and expand the list of mandatory skills and competencies that workers must acquire as a result of the internship.
7. After the internship, workers must receive access to work on a proper level:
 - Workers who received poor grading during their internship must be denied access to work;
 - A committee must allow access to individual work after an internship. Such a committee must be comprised of: ETS of the business unit, experts in fire safety and occupational safety, other profile specialists.
8. Create and introduce a system of mentorship for workers with less than two years of experience.
9. Change the approach to conducting BSAs:
 - Determine a list of encouraged and prohibited behavioural aspects for each BU and each shop;
 - Shopfloor managers must set tasks for their subordinate foremen to monitor their workers in relation to the above-listed aspects;
 - Foremen must report weekly or biweekly to their shop floor managers about the conducted BSAs;
 - Shop floor managers must report in person monthly to their managers of BU about the BSAs conducted in their shop;
 - Managers of BUs must report in person about the BSAs in their BUs during the MC meetings;
 - Design behavioural guidelines and posters to post on sites.
10. Launch the programme 'Team Care' or 'Do not be indifferent to Fellow Workers':
 - Organize an awareness campaign about the importance of careful and empathetic attitudes to safe behaviour and work conditions of other people;
 - Introduce mechanisms that allow conscious workers to correct and prevent hazardous actions of other people without starting a conflict;
 - In the future, once this approach is firmly integrated into the corporate culture (not earlier than 2019), we introduce collective responsibility for dangerous behaviour that has led or could have led to grave consequences.

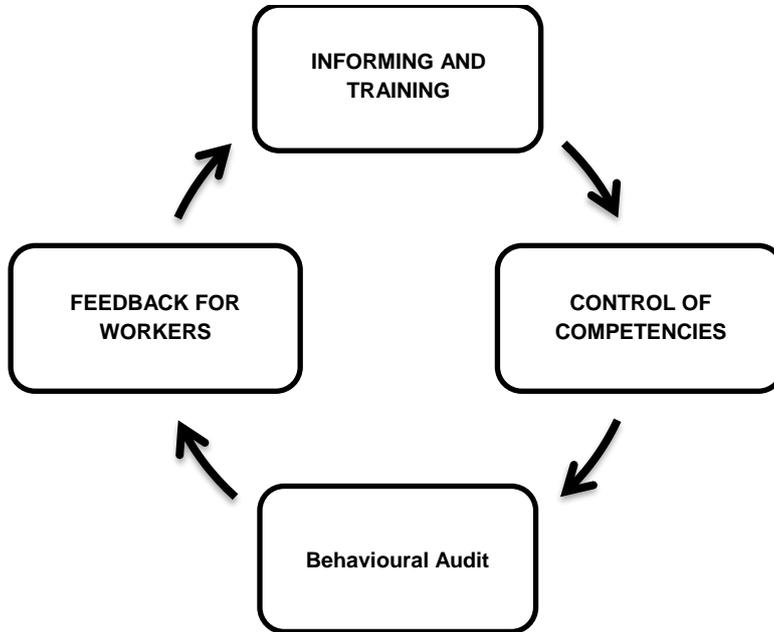
These measures will allow:

1. Elimination of detected problems in the existing training system and link all parts of the process.
2. Creation of a set of efficient methods to establish a good educational process.
3. Teaching of modern methods of teaching to managers.

4. Improvement of the quality of training for workers and their safety competencies.

It will promote:

1. a feeling of conscious and responsible attitude of the workers to their job, their safety, and safety of others;
2. a reduced role in the 'human factor' in incidents, and consequently, fewer injuries.



6. Target Programme 'Mining Safety'

In this section, we briefly describe the main points of this target programme:

According to the long-term development plan for the crude-ore resources of Apatit JSC for 2017–2035, the share of underground mining will increase:

- in 2017, open-pit mining—25%, underground mining—75%;
- in 2035, open-pit mining—15%, underground mining—85%.

Mining safety will thus be a key priority.

The analysis of underground incidents has allowed the causes of incidents to be divided into three large groups:

- Lack of knowledge and responsible and mindful attitude to safety;
- Poor level of work organization, poor industrial culture and culture of industrial relations;
- The level of development of the technological process that resulted in an incident.

Although the first two groups are very important, we must pay special attention to the third group because machinery and technology play the most significant role in the system of occupational safety during underground mining. The right choice of a technological process (mining system) is an important factor in the mining industry and especially during underground mining.

This is why the target programme has a special focus on the search for new solutions in machinery and technology. The questions of a conscious and responsible attitude to safety at work will be solved both through corporate programmes and special modules of this programme for mining safety.

'... In order to provide a safe occupational environment in technological processes (people must be safe during their working shift) we must aspire to keep up with the latest technology of mining, use the most advanced methods and approaches that will allow us not only guarantee safety at the facility but also cut costs and encourage growth of business'.

7. Target programme 'Provision of Safety for Operation of Motor, Railway, and Inland Transport'

The issue of providing safety of transport operation applies to all enterprises of the Group, regardless of what industry they operate within.

The analysis of incidents demonstrates that the injuries obtained while operating and maintaining transport vehicles account for 27% of all injuries in 2014–2016. In total, within the group of enterprises: 18% are related to motor transport and self-propelled vehicles (operation, repairs, revision, loading and unloading from a transportation vehicle), 9%—to railway transport (operation, maintenance of the rolling stock, locomotive, and switching). This data does not take into account the injuries obtained underground as a result of rock fall while the injured was outside the vehicle cabin and injuries obtained during the revision of vehicles on the territory of the facility.

The Company uses transport to ship cargo and to deliver personnel to the facility by buses.

7.1. A brief analysis of the current situation and current works to improve safety

At the moment, we are in the process of improving safety on motor and railway transport, in particular, all work can be divided into two blocks:

Block 1—Design and introduction of infrastructure enhancement programmes. Their objective is to resolve problems that have accumulated over recent years related to the wear of the corresponding infrastructure. Normally, such programmes require significant funding.

Block 2—Design and introduce a number of target programmes to resolve the most pressing issues that can be largely solved through organizational measures or do not require such significant funding as infrastructure programmes.

7.3. Primary focus areas within the directive 'Safety on Motor Transport'

7.3.1. Current Work

At the moment, we have completed most of the work within the following areas:

7.3.1.1. Increase safety of transportation within the territory of the enterprise

The following has been done:

- The road signage issue is currently in the process of being resolved. There were none before; we have installed some primary ones, and we will install the rest later. The situation is envisaged to be resolved in 2 years.
- Speed bumps installed in front of railway crossings. Before there were 7 road accidents with cars and trains in 1 year, now there are 0.

- Driving culture training: we started monitoring speed limits and actually making a stop in front of railway crossings using GPS data. Many issues were initially detected and we worked on them. It helped improve discipline for this rule. Once our drivers started following it, other drivers did too.
- Work began on organizing car parks: old car parks were organized, and new ones built, rules were introduced for reverse parking to ensure more efficient parking and provide a better angle of view at the start of driving.

7.3.1.2. Improvement of safety during commuting of workers by bus

At the moment, we are focusing on safe transportation by bus, since a serious accident involving a bus might result in injuries and even deaths of several people. There have been accidents with buses within the Company and cases when bus drivers violated the highway code (hereinafter—HC) and drove recklessly (aggressively), including on federal highways, under risk of crashing against large vehicles.

It is worth mentioning that as of today all bus commute services for the Company are outsourced. It means that the issue of guaranteeing safety is further complicated by managing the safety of contractors.

The following has been done:

1. Design and introduction of a corporate standard for the provision of transport and traffic safety.
2. Much work has been done to include the requirements of this standard into agreements with commuting agencies.
3. The corporate centre (together with the Transport Agency and Directorate for IS&OP) organizes and coordinates 'seasonal campaigns' related to weather changes. These campaigns include:
 - a. meetings with executive managers of transport companies;
 - b. monitoring instruction sessions;
 - c. spot checks on roads and stops (thanks to 1 specialist of the TA of PhosAgro-Cherepovets JSC);
 - d. control of in-vehicle monitoring systems and use of their data to encourage safe driving culture among drivers.
4. Commute routes for buses have been changed (avoiding dangerous turns).
5. Unsanctioned and unequipped bus stops have been eliminated.
6. Speed limit set for buses (stricter than normally in the HC).

7.3.2. Further suggestions for the Strategy of Industrial Safety and Occupational Protection

7.3.2.1. Adherence to Programmes for Motor Transport Infrastructure

At the moment, the programme for motor transport infrastructure is in operation only in PhosAgro-Cherepovets JSC. There are no such programmes at other enterprises.

Suggestions:

- Design and approve programmes for Apatit JSC, the Balakovo branch of Apatit JSC, Metakhim JSC.
- Continue to adhere to the programme at PhosAgro-Cherepovets JSC, in particular with regard to road signs, pedestrian crossings and pavements, car parks.

7.3.2.2. Continue to develop the programme for safe bus commute

As of today, we have some positive experience in developing and introducing such programmes. In the past, it was mainly in reaction to an incident. We also have a positive experience with introducing a programme as a preventive measure during the spring of 2017.

Suggestions:

- Adhere to this programme all-year-round, with a focus on seasonal features.
- We need to make the required changes to an existing corporate standard, develop a sample programme and other guidelines.

7.3.2.3. Improve the procedure for choosing contractors for works involving the use of motor vehicles

If work requires the operation of transport, Candidates must present documents confirming that they have the required means of transport, personnel, and comply with the HC before the end of bidding. These documents, in particular, must include:

1. A list of transport vehicles (hereinafter—vehicles) they own, in the amount required to complete the work, including replacement transport.
 - The rental of extra vehicles is permitted, granted that the Candidate and the carrier sign a rental agreement for a vehicle with a crew and reflect compliance with the requirements of the Provision of Traffic Safety. If a Candidate wins the bidding, he must present a letter from the carrier in which he agrees to sign a rental agreement.
2. The required qualified personnel available in the Candidate's or carrier's staff pool:
 - trained and certified ETS, in particular, trained in HC, traffic safety, and road use permission (the Candidate must present copies of certificates confirming successful completion of all the required trainings);
 - drivers and engineers with a Russian driving license for the required categories, with medical certificates (present copies of driving licenses and medical certificates).

The carrier must have a notice of entrepreneurship.

7.3.2.4. Introductory instruction sessions for drivers

The standard programme of introductory instruction session covers traffic issues only to the extent sufficient for workers who are not drivers or operators of specialised machinery.

This is why we suggest introducing a special introductory sessions for drivers and operators.

For work longer than 1 day	For one-time drives
Before work starts, all employees of the Contractor must attend an introductory instruction session on traffic safety as required by the programme. The TA specialist conducts this session after a session on IS&OP.	The TA specialist who approves the issue of transport pass conducts the session.

7.3.2.5. Introduce a pass system for contractor's vehicles

We suggest the following procedure be introduced:

In order to obtain a transport pass, the Contractor must present the following documents to the TA:

1. An application signed and stamped by the Contractor and the agreement curator assigned by PhosAgro-Cherepovets JSC, mentioning:

- purpose of entering the territory of the enterprise, reference number of contract with PhosAgro-Cherepovets JSC;
- list of vehicles including the mark, registration number, owner, and assigned drivers.

If the Contractor rents vehicles from third parties, he must present a copy of the rental agreement for the vehicles with a crew between the Contractor and the carrier that includes all the requirements of the Provision of Traffic Safety.

2. Copies of driver's documents, each assigned to a certain vehicle:
 - a. driving license;
 - b. medical certificate;
 - c. personal pass to PhosAgro-Cherepovets JSC;
 - d. for transportation of hazardous cargo (hereinafter—HazC)—certification for transportation of hazardous cargo (hereinafter CTHC);
 - e. for cranes and lift trucks—certificates of a crane or lift truck driver.

3. Copies of vehicles documents:
 - a. registration certificate;
 - b. third-party motor insurance;
 - c. vehicle test certificate;
 - d. for transportation of HazC—permit on transportation of HazC;
 - e. for cranes and lift trucks—pages of the vehicle passport with dates of the most recent partial and complete survey.

Consider the possibility of introducing two types of passes:

- for personal motor vehicles for employees of PhosAgro-Cherepovets JSC, with a limited period of validity;
- for the transport of legal entities and individual entrepreneurs, with a limited period of validity.

A TA specialist will revise the documents and make a decision on issuing a pass. The back of the pass contains a reminder of traffic safety rules, signed by the driver.

7.3.2.6. Introduction of an entry protocol procedure for the company territory

When someone is passing the checkpoint (hereinafter—CP) an employee of the private security company (hereinafter—PSC) must check the following:

- possession of a valid personal driver's pass;
- possession of a valid vehicle permit (including on the vehicle transported on the bed or inside the vehicle);
- Driver's full name in the personal pass and the vehicle permit must be identical;
- for companies and individual entrepreneurs working on the territory of PhosAgro-Cherepovets, check the trip ticket for the medical stamp of the Polyclinic No.1 located on the territory of PhosAgro-Cherepovets JSC;
- for one-time entries, perform an alcohol test using a mobile alcohol tester or a stationary tester.

7.3.2.7. Introduce a work permit protocol

When preparing a method statement, the Contractor devotes a separate section to the operation of vehicles. This section includes:

- a list of vehicles involved in the work;

- mandatory documents which a driver must possess before the start of work (proper trip ticker with a notice of pre-trip medical examination, driving/operating license for a corresponding category. For transportation of HazC—transportation permit for HazC; for cranes and lift trucks—a copy of the corresponding certificate of a crane/lift truck operator;
- description of work order and safety measures.

The Method Statement must be approved by the representative of the TA.

The curator of works at PhosAgro-Cherepovets JSC must fill out the corresponding section of the work permit that describes the work of transport according to the approved Method Statement.

Every day before the start of work, the curator must confirm that all mandatory documents are provided: a proper trip ticket with a notice of the pre-trip medical examination, driving/operating license for a corresponding category. For transportation of HazC—transportation permit for HazC; for cranes and lift trucks—the corresponding certificate of a crane/lift truck operator.

7.3.2.8. Introduce a control procedure for vehicle operation within the enterprise by the transport agency

It is suggested that regular flash inspections be implemented to control the state of vehicles, how they are operated, maintained, if they comply with the HC.

Regular inspections of employees of PhosAgro-Cherepovets JSC and contractor companies regarding compliance with the requirements of Road Safety when driving a bicycle, and behaviour of pedestrians.

Such inspections will be conducted by the employees of the Transport Agency, using company vehicles, and must be daily on both production sites (not less than 2 times each weekday and 1 time on weekends).

During the inspections, they will control compliance with mandatory rules of the HC, Company Standard 6.4-32-2014 'Provision of Road Safety at PhosAgro-Cherepovets JSC', etc.

All violations will be recorded on photo and video equipment.

Any violation will result in the issuing of a report and pre-established instructions. If needed, a fine may be issued.

If the violator does not comply with the instructions given or violates the rules repeatedly, such a driver/operator will be banned from working at PhosAgro-Cherepovets, temporarily or permanently.

7.3.2.9. Introduce control procedure for vehicle operation within the enterprise by the security agency:

- During tours of the territory—make sure that drivers comply with the rules of stops and parking.
- Violations will be recorded on camera and sent to the TA to draw up a report and provide the required instructions.
- If the violator does not comply with the instructions given to him or violates the rules repeatedly, such a driver/operator will be banned from working at the enterprise, temporarily or permanently.

7.3.2.10. Control exit from the enterprise

- When a vehicle passes through a checkpoint, a security guard must confirm that the driver's pass is present and valid.
- Once the pass becomes expired, it is withdrawn and sent to the TA.

7.3.2.11. Improve the local legislation for 'Motor Transport Safety'

All requirements for 'Motor Transport Safety' form part of the united standard of 2016, Company Standard 6.4-32-2016 'Provision of Road Safety at PhosAgro-Cherepovets JSC'. Such a standard is needed because many third-party companies use motor transport on the territory of the Company. The standard helps inform all these organizations about equal requirements applied to them. The existence of a united standard has proven its efficiency.

However, it still demands some improvement. Here are some more detailed suggestions:

Issuing and signature of order(s) by the General Director of PhosAgro-Cherepovets JSC who:

1. Establishment of requirements for the provision of road safety within the enterprise to be mandatorily included in technical assignments and work and service agreements. The following road safety requirements must be included as mandatory:
 - a) daily completion of trip tickets for each vehicle according to the order of the Russian Ministry of Transport dated 18/09/2008 #152 'On Approving Primary Data and Process of Filling Out Trip Tickets';
 - b) equipping all vehicles with GLONASS or GLONASS/GPS devices, according to the order of the Russian Ministry of Transport dated 26/01/2012 #20 'On Approval of Equipping Transport Vehicles in Operation, Including Special Vehicles of Category M Used for Commercial Transportation of Passengers, and Category N, used For Transportation of Hazardous Cargo, With Satellite Positioning Equipment GLONASS Or GLONASS/GPS';
 - c) equipping vehicles with digital tachographs, according to the order of the Russian Ministry of Transport dated 13/02/2013 #36 'On Approval of Requirements to Tachographs Installed on Vehicles, Categories and Types of Vehicles Subject to Equipping with Tachographs, Rules of Use, Maintenance, and Control of Tachographs Installed on Vehicles';
 - d) issuing of carrier liability insurance policies for each vehicle according to the requirement of the Federal Law dated 14/06/2012 #67-FZ 'On Compulsory Liability Insurance of Carriers for Damage to Life, Health, Property of Passengers, and Reimbursement for Such Damage Done During Transportation of Passengers, and on Reimbursement for Such Damage Done During Transportation of Passengers by Metro Trains';
 - e) carrying out pre-trip and after-trip medical examinations of drivers in state, municipal, and private health care institutions with a license on 'breath analysis' services;
 - f) approval of a traffic plan of the enterprise territory for pedestrians.
2. Make Company Standard 6.4-32-2016 'Provision of Road Safety at PhosAgro-Cherepovets JSC' a compulsory appendix to all agreements if a work (service) is provided on the territory of the enterprise;
3. Approval of obligatory pre-bidding qualification of Candidate by the Transport Agency and introduce the corresponding questions in the tender form;
4. Authorising the TA to approve issue of transport passes after the carrier present the established set of documents;
5. Making changes to the work permit;
6. Approval of mandatory requirements for drawing up and approving the Method Statement.

7.4. Primary focus areas within the directive 'Safety on Railway Transport'

7.4.1. Current Work

At the moment, we are working on following areas:

7.4.1.1. Infrastructure Enhancement Programmes

The programme of enhancing the infrastructure of Apatit JSC is successfully completed. The programme at PhosAgro-Cherepovets JSC is in progress.

7.4.1.2. Increase Staffing

Increase of staffing is currently in progress:

1. we are hiring machine operators to train as operators and instructors,
2. hiring section foremen.

7.4.1.3. Improvement of Discipline to Prevent Incidents

We are also stepping up punishments for transport accidents—such as firing in case of significant damage, for example as a result of a rolling stock getting derailed. We are considering an option of reimbursement for the damage. It brought the workers 'back to earth' and helped decrease the number of incidents.

7.4.2. Further suggestions for the Strategy of Industrial Safety and Occupational Protection

7.4.2.2. Improve Qualifications of Personnel Involved in Train Operation

This is a focus area for provision of safety on railway transport. The measures introduced as of today are not enough, we must do better in this area.

Suggestions:

- Creation and introduction of a programme of further training.

7.4.2.3. Personnel Certification

At the moment, there are problems with legally firing employees who violate safety rules. They can be solved by introducing a certification procedure.

Suggestions:

- Creation and introduction of rules of personnel certification in railway safety.

7.4.2.4. Lighting on Crossings

At the moment, insufficient lighting on railway crossings at the facility is one of the major dangers for personnel and machinery.

Suggestions:

- Creation and introduction of a programme for lighting on railway crossings.

7.4.2.5. *Separate Communication Channels*

At the moment, the radio channels used by the personnel involved in forming and moving train formations are overloaded. This may lead to serious accidents.

Suggestions:

- Together with the Directorate for Information Technologies (hereinafter—DIT), introduce a programme to separate communication channels.

7.4.2.6. *Monitor the safe operation of machinery on train tracks and their vicinity.*

At the moment, there is no control system for the safe operation of machinery on train tracks and their vicinity. There is also no existing mechanism to record damage and organize compensation.

Suggestions:

- We suggest the monitoring of the movement and operation of vehicles and special machinery on the facility by:
 - assigned employees of the TA;
 - security guards.

7.4.2.7. *Improve the local legislation for 'Railway Transport Safety'*

There is no unified standard for 'Railway Transport Safety'. The number of third-party organizations using railway transport at our facilities is limited only by the requirements of the Russian Railways OJSC. However, a recent audit highlighted the following issue: Apatit JSC and PhosAgro-Cherepovets JSC use different documents for the levels 'Regulation on Internship', 'Regulation on Certification of Professions and Positions Involved in Provision of Safe Railway Transportation', 'Programme of Seminars', 'Personal map of Instructions', etc. Such differences make it difficult to provide and monitor the safety of these operations.

We suggest the unification of all documents related to safe railway transportation at all facilities.

8. Target Programme 'Safety of Contractor Companies'

8.1. Recognise the importance of this area

Managing the safety of contractor companies is an important part of safety culture in most major industrial companies today. The need to manage the safety of contractor companies is justified not only by empathy but also numerous cases when dangerous actions of contractors led to serious negative consequences for clients.

Many leading companies apply the principle of 'unified workforce', In all cases, with regard to permanent and long-term contractors. This principle states that workers of contractor companies must be involved in following the safety culture to the same extent as in-house workers.

All companies that have been working on this issue for a while have come to the conclusion that managing safety of CCs is a multi-stage process. However, the stage of interactions which take place during work is not the first and by far not the most important one. Companies understand that in order for a Contractor to complete contracted work in a safe manner, they must do certain preparations (evaluate work risks, inform tender participants about working conditions and IS&OP requirements correctly and in full, select the contractor carefully and confirm his readiness and ability to work safely, etc.). Many companies also evaluate how safely contractors did the work and use this evaluation in future cooperation and provide feedback for the contractor. This multi-stage approach has become the gold standard of the industry and is

reflected in both in-house procedures and requirements of international financial organizations to large-scale projects implemented with the help of contractor companies.

8.3. Management of the safety of contractor companies at PhosAgro Group of Companies

The major portion of works in this area was completed by the working group for the safety of CCs at PhosAgro-Cherepovets JSC. Having completed the analysis of the principal issues that occur when working with contractors, the Working Group came up with the conclusion that the safety management for contractors must start long before the contractor arrives at the facility of the Group, and also that contractors must be evaluated from the point of view of their safety culture and use this evaluation in future cooperation. As a result of several discussions, the Working Group created a generalised process of safety management for CCs consisting of 15 steps (see Table below).

Stages of interaction with contractor companies to provide safety of their work (results provided by the Working Group of PhosAgro-Cherepovets JSC, as of April 2017)			
	Stage	Result	Participants
1	PRELIMINARY EVALUATION OF RISKS OF THE PLANNED WORK	<ul style="list-style-type: none"> — The client understands the principal (obvious) risks that the Contractor Company (hereinafter—CC) may face during work. — The results of preliminary evaluation are presented in the format that allows to include them in technical assignment 	<ul style="list-style-type: none"> — BU (client); — Office of Industrial Safety and Occupational Protection (hereinafter—OIS&OP); — The representative of the agency that initiates the contract; — Supervision, Technical Control, and Diagnostics Department (hereinafter—STCDD)
2	DEVELOPMENT OF A TECHNICAL ASSIGNMENT	<ul style="list-style-type: none"> — Preliminary evaluation of risks is reflected in the technical assignment (hereinafter—TA). — The TA includes requirements for the CC: <ul style="list-style-type: none"> • develop measures to lower these risks. • make a detailed assessment of ALL risks before the start of work, • in the commercial offer, in a separate paragraph, indicate the costs of providing safety, taking into account the cost of lowering principal risks. 	<ul style="list-style-type: none"> — Representative of the agency that initiates the contract; — AIS&OP
3	INFORM POTENTIAL CONTRACTOR COMPANIES OF IS&OP REQUIREMENTS	<ul style="list-style-type: none"> — The Client believes that participants of a tender acknowledge and understand the Client's requirements to safety. 	<ul style="list-style-type: none"> — A representative of the contract initiator; — AIS&OP; — Procurement Department (hereinafter—PD); — Potential and involved CCs
4	PRELIMINARY QUALIFICATION EVALUATION	<ul style="list-style-type: none"> — Preliminary evaluation of the CC's ability to ensure the required level of safety is based on the analysis of the information presented by the CC. — Expert findings of the AIS&OP 	<ul style="list-style-type: none"> — PD; — AIS&OP; — Department for Development of Occupational Safety Management Systems (hereinafter—DDOSMS); — Representative of the contract initiator
5	CHOOSE CONTRACTOR COMPANY	<ul style="list-style-type: none"> — Choose a CC that is able (according to the results of preliminary qualification evaluation or evaluation of the CC 	<ul style="list-style-type: none"> — Tender Committee (hereinafter—TC); — BU (client, for individual procurements);

Stages of interaction with contractor companies to provide safety of their work (results provided by the Working Group of PhosAgro-Cherepovets JSC, as of April 2017)			
	Stage	Result	Participants
		obtained during or after completion of work) to provide safety during work. — Minutes of the tender committee meeting	— AIS&OP; — Representatives of CC (for open tenders)
6	SIGN CONTRACT WITH CONTRACTOR COMPANY COORDINATE MS (TA)	— A contract is signed with the CC that takes into account the results of preliminary and detailed evaluation of risks and includes safety measures with an estimated cost. — The MS (TA) coordinated between the Client and CC before signing the contract is an appendix to the contract	— A representative of the contract initiator; — BU (client); — Interested parties of the Client (senior experts, STCDD, and other)
7	EVALUATE THE READINESS OF CONTRACTOR COMPANY TO START WORK	— The Client believes that the CC has enough resources to carry out the work in a safe manner: <ul style="list-style-type: none"> • they have qualified personnel; • they have functioning equipment, machinery, and devices; • they have personnel management resources; • they have the required subcontractors (full list) and their resources. — Plan of corrective measures. — All the critical measures in the correcting plan are completed before the work starts	— STCDD; — Office of the electrical supervisor; — Transport agency; — AIS&OP; — Economic Security Directorate
8	CLIENT PREPARATION OF EQUIPMENT	— Sites are outlined, the volume and content of preparation works are determined, as well as their order and safety measures, considering the results of risk evaluation. — The equipment (facility) is prepared for repair and safe work. — The Client places a mark in the work permit. — The equipment subject for repair meets with all the safety requirements (power cut off, washed, blown, etc.)	— BU (client); — CC; — AIS&OP; — A representative of the agency that initiates the contract
9	DRAWING UP AND ISSUING WORK PERMITS (SAFETY PERMITS)	— A documented confirmation that the Client and the CC took all the required measures to ensure safe repair work.	— BU (client); — CC; — Interested parties on the Client's side (when applies); — Gas rescue team, Chief Engineer's Office; — Directorate for Repairs; — Directorate for Development, Operation, and Repair of Ammonia Facilities; Directorate for Capital Construction; AIS&OP
10	GRANTING ACCESS OF WORKERS OF CONTRACTOR COMPANY TO WORK	— A permit written by the Client to allow work in the designated repair area (with the required sections of the work permit filled out). — The personnel of the CC is allowed to start the work. — Supervisors have instructed their personnel directly on the work site; the personnel are aware of the specifics of	— BU (client); — CC; — AIS&OP; — A representative of the agency that initiates the contract

Stages of interaction with contractor companies to provide safety of their work (results provided by the Working Group of PhosAgro-Cherepovets JSC, as of April 2017)			
	Stage	Result	Participants
		their work and any requirements as well as interaction with representatives of BU	
11	CONTRACTOR PREPARES SITE FOR WORK	<ul style="list-style-type: none"> — They carry out the technical and organizational measures required to provide safe repair work. — The site complies with all the safety requirements 	<ul style="list-style-type: none"> — CC; — Directorate for Repairs (STCDD)
12	INTERACTION IN THE WORK PROCESS	<ul style="list-style-type: none"> — The CC works in a safe manner, complying with all the norms and limits. — The CC reacts adequately to violations. — The employees of CC are visually distinct. — There is an efficient mechanism of interaction with the CC. — The CC has a contact person with the right to make decisions. — The interaction between the CC and Client is regular and recorded, with visible results in the form of a continuous improvement plan. — There are no incidents, accidents, injuries, etc. 	<ul style="list-style-type: none"> — BU (client); — CC; — A representative of the agency that initiates the contract; — AIS&OP; — STCDD.
13	PRE-LAUNCH OPERATIONS (TEST RUNS, EQUIPMENT TESTS)	<ul style="list-style-type: none"> — All parties realise the crucial importance of this stage (STOP sign). — Test runs can be started only after all risks have been evaluated (new discussion of risks with the CC) and an audit of readiness for the start of test runs. — New work permits 	<ul style="list-style-type: none"> — BU (client); — CC; — Interested parties on the client's side (representatives of the primary specialised groups) — A representative of the agency that initiates the contract; — AIS&OP
14	ACCEPTANCE OF WORKPLACE AND EQUIPMENT	<ul style="list-style-type: none"> — The client receives the equipment repaired by the CC. — The state of the equipment/work place is the same (not worse) than before the start of works. — All technical documentation and instructions are updated according to the results of repair. — All workers are informed about the changes resulting from the repair. — Certificates of readiness. — Repair and assembly documents are filled out. — Experts in charge fill out their report on Front End Engineering Design (hereinafter—FEED) in the launch journal. — The launch is done on time, according to the norms of the technological regime (hereinafter—NTR) 	<ul style="list-style-type: none"> — BU (client); — CC; — Interested parties of the Client (senior experts, technical supervisors) — A representative of the agency that initiates the contract; — AIS&OP
15	EVALUATION OF CONTRACTOR COMPANY DURING OR AFTER COMPLETION OF WORK	<ul style="list-style-type: none"> — Objective and true comprehensive evaluation of the CC. — Apply the results to the choice of a CC in the future. — If necessary, put the CC on the black list 	<ul style="list-style-type: none"> — BU; — CC; — A representative of the agency that initiates the contract; — AIS&OP

Simultaneously, upon the request of the management of PhosAgro-Cherepovets JSC, the suggestion of introducing an alternative to fining the CCs who violate the rules of IS&OP during works in the facility, has been developed.

The following measures are being taken and planned to further develop the area 'Safety Management for Contractor Companies':

Approximate deadline	Measures
H1 of 2017	<ul style="list-style-type: none"> — Test of a number of steps in interaction with contractor companies of the Directorate for Repairs at PhosAgro-Cherepovets JSC, in particular: <ul style="list-style-type: none"> • Client evaluates risks and work conditions; • Bidding participants are informed about working conditions and primary IS&OP requirements; • Coordination of MS (TA). — Develop alternative methods of impact on the CCs violating IS&OP requirements.
H2 of 2017	<p>Spread previously tested steps on other directorates of PhosAgro-Cherepovets that hire contractors and on other facilities of the Group. Finalise the process of interaction with CCs before and after signing a contract, prepare to introduce it in all facilities of the Group</p>
2018	<p>Introduce the updated standard in all facilities of the Group</p>

It is important to emphasise that an efficient safety management process for contractor companies can only be introduced in all the directorates involved in the process of choosing and hiring a CC to take part in the process. These include both the Directorates that order CC's services and the Directorates involved concerned with procurements.

It is also suggested that a target programme 'Safety of Contractor Companies' be designed as a separate project supervised by the Directorate for Management and Implementation of Projects.

9. Target Programme 'Introduction of System Blocking–Marking–Control'

The 'Blocking–Marking–Control' system (hereinafter—BMC) is a system that allows preventing equipment from turning on or supplying power/medium to it when there are people in hazardous areas. This system will help prevent injuries during repair and maintenance works. The BMC system is also known as LOTO, as in Lock-Out, Tag-Out.

The Management Committee for IS&OP made the decision to introduce this system in the facilities of PhosAgro Group during the meeting on 8 December 2016. The decision was made after analysing the information about three incidents that took place in 2014–2016 where the direct cause of injury was that the equipment turned on or medium was supplied at the moment when the injured was in the hazardous area.

It is worth mentioning that the introduction of the BMC system is one of the trends that are spreading fast in industrial companies of Russia, as was noted during the All-Russian Week of Occupational Safety celebrated in April 2017, in Sochi. According to the reports of companies specialising in equipment for BMC systems and reports of production companies, BMC systems are introduced or currently in the process in many businesses, from chemical and petrochemical to food and pharmaceutical.

BMC system works so that equipment will be switched off and remain blocked in a safe state for the duration of repair and maintenance works. It blocks not only general controls but also power supply (switches, valves, etc.). It is made with special locks and clamps. Clamps are used when power supply points cannot be stopped with a lock. For example, on knife-switches and old-type cutouts, on valve hand wheels.

In order to design and introduce a BMC system, one needs to determine all power supply points on the equipment, taking into account all repair options and then find the right clamps and locks. Blocking instructions can be found in special map, or blocking maps (BMC maps). There are also marking requirements for blocking points and control of blocking described in these maps.

When the decision was made to introduce BMC systems in facilities of PhosAgro group, the following factors were taken into account: 1) novelty of the project for the Group, 2) the need to introduce the system in several shops of a Group enterprise and in Mekhanik LLC. As a result, it was decided to implement it as an all-corporation project supervised by the Directorate for Project Management and Implementation. The project received the following name and marking: Project 97L, 'Introduction of System Blocking–Marking–Control (BMC)'. The project is being implemented in four production facilities of the Group and in Mekhanik LLC.

At the moment, the implementation of the project is on schedule, with its status regularly reviewed by the Management Committee. The Working Group for the project includes technical managers and heads of Directorates for IS&OP in the facilities that take part in the project. In addition, other employees of corporate directorates join the Working Group as needed. The head of the project and the working group is the employee of the Directorate for IS&OP.

The scheduled plan of the project sets three primary stages of implementation:

Stage	Stage results
Stage 1. Equipment audit	Choice of consulting contractor. Contractors visit all work shops included in the project perimeter. Specification of all power supply points taking into account specifications of the repair works required for the equipment and repair works themselves. Choice of the required clamps, locks, and other BMC devices. Development of BMC maps. Creation of a complete list of BMC devices and their amount to start a procurement tender.
Stage 2. Designing of corporate documentation	Planning of an all-corporation standard or a regulation on the BMC system. Designing training materials for Stage 3.
Stage 3. Launch of the system	Supply of BMC devices by the supplier selected during the tender. Acceptance and allocation of devices among shops, organize storage and administration conditions. Training of users. The consulting contractor or equipment supplier provides assistance on how to use the system.

Note: The procurement tender for BMC devices is to be conducted after the full list of BMC devices is formed at Stage 1.

Project perimeter:

Facility, branch	Work shops, sites	Notes
PhosAgro-Cherepovets JSC	<ul style="list-style-type: none"> — AM-1 — AM-2 — AM-3 — Phosphoric Acid Plant — Mineral Fertilizers Plant 	

Mekhanik in Cherepovets	— RMS	
OF APATIT JSC	— ANOF-3 — Oil and lubricant warehouse of the ANOF-3 boiler room — Rasvumchorrsk Mine	
Mekhanik in Kirovsk	— Production site ANOF-2 — RMS, 4 departments	
Balakovo Branch of Apatit JSC	— Phosphorous Fertilizer Shop — Mineral Salt Shop — Steam and Gas Turbine Shop	
Mekhanik in Balakovo	— Site #1: <ul style="list-style-type: none"> • Machine department • Forge • Boiler and welding production unit • Anti-corrosion unit. 	
Metakhim JSC	— Phosphoric Acid Plant — MFP, site #2	
Mekhanik in Volkhov	— Spare parts production site	

The end goal of the project is to ensure that all repair and maintenance works in the shops comprising the project perimeter include BMC system. The BMC system is used both by the shop personnel and by workers of Mekhanik LLC and other contractor companies. There must be no chance of equipment switching on or power/medium being supplied to it while there are people in hazardous areas.

Target Programme—Introduction of the 'Safety' information system.

The initial reason for the introduction of an information IS&OP system in the Company were the changes made to the requirements of Rostekhnadzor (RTN) to report documents. Starting from 2014, all reports to RTN must be presented in digital form, as MS Excel files, to be later integrated with the KSI 'SPK RTN' (for online control). Since there was no information system in the Company, the development of such a report took a great amount of effort and time because the report must contain information about hazardous production facilities, personnel, in-house and external revisions, etc. It became obvious that the information system must allow for the integration of information from other information systems and databases, such as Oracle, Boss-kadrovik, and others.

The pilot project to develop and introduce such a system was launched in 2016 in Apatit JSC. Considering the complexity and scale of work, the decision was made to implement this project under the supervision of the Directorate for Project Management and Implementation. At the moment, they are working as planned, and the status of the project is regularly reviewed by the Management Committee headed by the General Director. The working group for the projects consists of about 45 people, including the personnel of the Engineering Centre, Agencies of IS&OP, shop representatives. The head of the project and the working group is the employee of the Agency for IS&OP at PhosAgro-Cherepovets JSC.

The project was launched in August 2016 in Apatit JSC and completed successfully in April 2017. Bearing in mind that Apatit JSC is a mining enterprise, the system configurations are focused on automating the process of assigning shifts, and the final software product was named Book of Instructions and Shifts (BI&S).

Then, it was decided to extend this information system to other enterprises of PhosAgro Group. According to the project plan, the duration of work for each enterprise is as follows:

- PhosAgro-Cherepovets JSC: May–September 2017
- Balakovo Branch of Apatit JSC: October–November 2017
- Metakhim JSC: November–December 2017

The introduction of this information system in enterprises of the chemical cluster requires significant revision. This fact justifies the stage nature of works. Since chemical enterprises of the Group are specialised, this information system will be given a different name than that in Apatit JSC. The temporary name used now is ISU 'Safety'.

The end goal of the project is to create a unified convenient information system that will allow the recording and storage of IS&OP data in digital form, without paper (whenever possible) and not duplicate information.

11. Development of Management System

This document treats management system as a set of documented procedures describing processes related to IS&OP. It is important to realise that not all processes should be described as corporate standards. The list can include resolutions of administrative agencies, including IS&OP committees, orders, guidelines, manuals. Therefore, this section will be dedicated to IS&OP management tools, some of which will be covered by corporate standards, while the rest—by other documents.

11.1. Improvement of the statistics collection, analysis, and report system

A system for collection, analysis, and reporting statistical data provides an opportunity to monitor IS&OP data and make informed management decisions. Moreover, this system is essential for preparing external reports, both compulsory (to state monitoring agencies) and voluntary (such as reports within Corporate Social Responsibility or the rules established by industry associations).

As of today, the Company has a system for collecting, analysing, and reporting statistics. A recent achievement is the application of LTIFR to prevent incidents among the Group personnel. The requisite reports are prepared for external users. However, this system demands changes and upgrades in two areas:

- Correction of practical calculation of LTIFR applied to in-house workers;
- Introduction of LTIFR applied to contractor workers.

11.1.1. Correction of practical reports of LTIFR applied to in-house workers

LTIFR has been calculated since 2014, when we started a joint project with DuPont. However, in early 2017, we took a closer look at the LTIFR calculation method for non-financial reports in 2016, and it became clear that up until then the Company had been using incorrect calculation method for this index.

LTIFR (Lost Time Injury Frequency Rate) shows the number of lost-time injuries, and must be calculated using the following formula:

$$LTIFR = \frac{N}{T} \times 200\,000,$$

where

- N is the number of injured with temporary (over 1 day) or permanent loss of productivity (including lethal cases) due to incidents during the reporting period,

- T is the amount of time actually spent working during report period,
- 200,000 is a conventional number used to normalise this index per an established amount of labour hours. Some companies use 200,000, other—1 million labour hours.

I. e. N stands for the number of people who were injured or died in incidents. Upon closer consideration, it became clear that until then the Company deemed N to be as the number of incidents, i. e. number of events, not people injured during incidents. This goes against LTIFR calculation rules. This error required correction. It would not have led to an increase in LTIFR in previous periods significantly because group incidents were rare.

It is suggested that LTIFR calculation be corrected as of the beginning of 2017.

11.1.2. Introduction of LTIFR applied to contractor workers

Ensuring the safety of contractor companies is one of our top priorities in IS&OP and we are making a lot of work in this direction (see the corresponding section of this Strategy). Consequently, we need to introduce an index showing the number of incidents among CC employees, both to monitor changes over time and to compare different CCs. We suggest the use of LTIFR for this purpose.

It is in line with global practice since most leading companies in terms of industrial safety use LTIFR in their work for their own personnel and for CC staff.

It is important to bear in mind that in order to calculate LTIFR for contractors, we will have to collect data about actual labour hours. It will take us some time to spread this approach to the entire Company. It is thus suggested that data collection be commenced in test mode starting from H2 2017, and in mandatory mode starting from early 2018.

11.2. Development of existing standards.

11.2.1. Behaviour-based safety audits

Behaviour-based safety audits are practised in all enterprises of the group and in all S&As. It can be stated that the Company has reached universal awareness of BBS since almost everyone knows about them. However, it is also true that there are many formalities in implementing BBS and using its results at the moment. According to reports, BBS implementation plans are 80–100% complete. At the same time, BBS is rarely used as a tool for the actual improvement of the situation. Plans of the Directorate for 2017 and 2018 focus on fixing it.

In 2017, we started working on enhancing the process of implementing BBS audits. To this end, we have developed an updated BBS training course for those employees who can act as in-house coaches: employees of IS&OP departments at managed enterprises and S&A. In H2, we are planning to carry out another mass training with the updated course for managers who conduct BBS audits.

Previous training materials on BBS (left after the DuPont project) demonstrated the following drawbacks:

- BBS audits in them were presented in the maximum possible universal form. This is a valid option for Companies that just start to learn about BBS, however, it does not answer numerous specific questions that junior and middle managers have while conducting BBS audits in enterprises of the Group.
- A number of methods described in the materials were presented as dogma, not as a recommended variant. As a result, all work in the area of BBS consisted in following the described steps and recording without actually explaining how to make BBS an efficient routine tool that can help with current issues.
- Educational materials did not have any examples from the Group's practice, including positive examples when BBS audits were used to solve problems and improve a given situation.

The updated BBS course includes more details about using BBS audit as an efficient tool in gradually forming safer working behaviour and improving dangerous situations that were recorded during audits.

It is suggested that these new additions be tested in practice in 2017 so that in 2018 they can be reflected in the updated version of the corporate standard.

11.2.3. Incident investigation

In 2015–2016, the Company laid good foundations for a system of in-house investigation of incidents using a special method to identify key causes of what happened. The next step is to make sure that this method is applied to investigations systematically and everywhere. In order to do this, it is suggested that a detailed training course on conducting in-house investigations be added to the corporate standard ST FAAG DPBIOT-07-2015 'Procedure of Incident Investigation'.

11.3. New standards

11.3.1. Danger identification and risk assessment

It is suggested that a method of danger identification and risk assessment be introduced that would be easy and convenient for workers and foremen to use before starting work. Variants of such methods exist in many companies under different names. 'Three Steps to Safety' introduced in Company's enterprises in 2016 are one of simpler variants.

However, 'Three Steps to Safety' is far from a comprehensive method. In fact, it is just a chain of actions that are supposed to be done: 1) stop, evaluate the danger, 2) take measures to eliminate the danger, 3) make the decision whether or not you can start working. The experience of companies who already use such methods shows that workers face two principal issues:

- Workers can not identify existing or potential dangers and have a tendency to diminish the gravity of potential consequences of a dangerous situation.
- Workers are not aware of or do not possess a mechanism to resolve problems, even if they have identified the problem, and they cannot take measures to provide safety. Often in such cases, workers consciously take risks and start work because 'it has to be done anyway'.

The first issue can generally be solved with additional training, guidelines, etc. The other issue can be solved by introducing procedures that on the one hand will prevent workers from doing a work that cannot be safely performed in their opinion (no punishment applied to the worker), and on the other, establish strict monitoring that workers and foremen do not violate the rules and restrictions on purpose. Over time this will lead to better planning on the part of junior managers and workers and the possibility of taking all the required safety measures.

To introduce such a method in the Company, the corresponding standard will have to be developed and mass training implemented. This is envisaged for 2018.

11.3.2. Evaluation of risks of planned works and production processes

It is suggested that methods of evaluating risks of planned works and production processes be introduced. With such methods, IS&OP risks of schedules repair works can be better evaluated as well as risks of certain processes if any changes are made.

The experience of developing IS&OP plans for principal business units has demonstrated that there is a need for such method now, to evaluate potential risks and dangers to safety in shops. This is required, in order to determine priorities: which problems need to be resolved first, which can be left for later. Introducing a unified method can help solve this issue.

We suggest that the Company will need to introduce a risk evaluation method in 2019–2020.

11.3.3. Training

As can be seen in previous sections of this document, training is a key to solving many tasks. It is therefore suggested that all our developments in the area of IS&OP be brought together into a single standard over time. The following shall be reflected in this standard:

- Training is a process of passing on knowledge and making sure (by testing or survey) that the trainee has successfully received this knowledge and can put it into practice.
- People who conduct trainings must have teaching skills.
- The training process must include the required visual and interactive materials (see—hear—do it yourself).

It is suggested that in 2017–2018 Company enterprises will have introduced the main changes in the training process. In 2019, the corporate standard will be completed.

12. Development of a function of industrial safety and occupational protection

In the current paradigm of IS&OP management, the function of IS&OP is determined as an 'in-house consultant', as 'a playing coach', as 'assistant' but not at a primary resource of providing the required level of safety and not as a 'police officer'. The aim is to emphasise that safe production is impossible without the active and efficient participation of managers of all levels and, of course, without all managers demonstrating their leadership qualities.

Main issues at this stage:

- No staff pool for a number of key positions.
- Some managers do not have enough managerial competencies such as working for the entire team, justifying decisions, developing subordinates, forming target programmes in priority areas.

Suggestions:

- Active formation of staff pool. The goal is to ensure sufficient candidates in the staff pool for positions of heads of IS&OS departments in all enterprises by the end of 2018. Senior management of enterprises must create and approve Individual Development plans for all candidates.
- Ensure that starting from early 2018 Individual Development Plans, created in cooperation with the Directorate for Personnel and Social Policy, including the formation of the required managerial competencies.
- Ensure that the heads and employees of IS&OP departments are actively involved in the implementation of this Strategy to help them develop competencies of modern safety management; Directorate for IS&OP will organize training session to reach the same goal, starting from H2 2017.