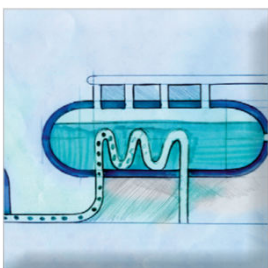
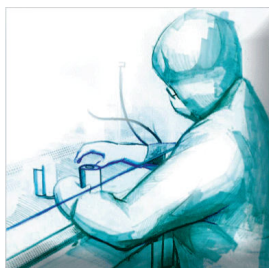
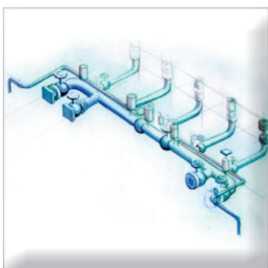


EGP INVEST LLC



## Experience of cooperation between companies EGP INVEST and JSC ATOMPROEKT during the design activities



Frantisek Fiedler  
29 November 2015

1. Introduction – Design and engineering company «EGP INVEST»
2. History of cooperation of «EGP INVEST» with Russian design institutes
3. New stage of cooperation – «EGP INVEST» - JSC «ATOMPROEKT.
4. Participation of «EGP INVEST» in MBIR project
5. Other forms of cooperation between «EGPI» and JSC «ATOMPROEKT».
6. Results of the mutual cooperation between «EGP INVEST» and JSC «ATOMPROEKT»,
7. Potential opportunities for international cooperation

# 1. Design and engineering company «EGP INVEST»

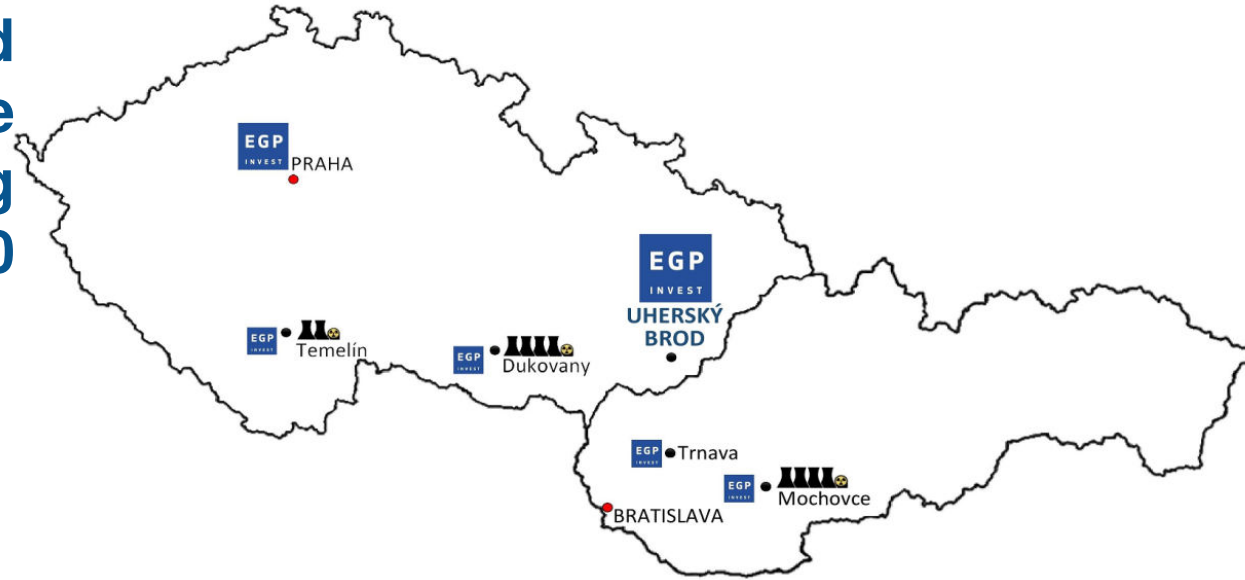
- The company «EGP INVEST» is a design and engineering company and possess with 55 years of experience of implementation of the projects in energy field. The company is a part of Group of companies JSC «Nuclear research institute REZ».
- The company has three offices – in Uhersky Brod and Prague (Czech Republic), there is also a subsidiary in Trnava (Slovak Republic).



# 1. Design and engineering company «EGP INVEST»



- There is also a specialized office on NPP Mochovce site, on site are working approximately 30 technicians and designers.

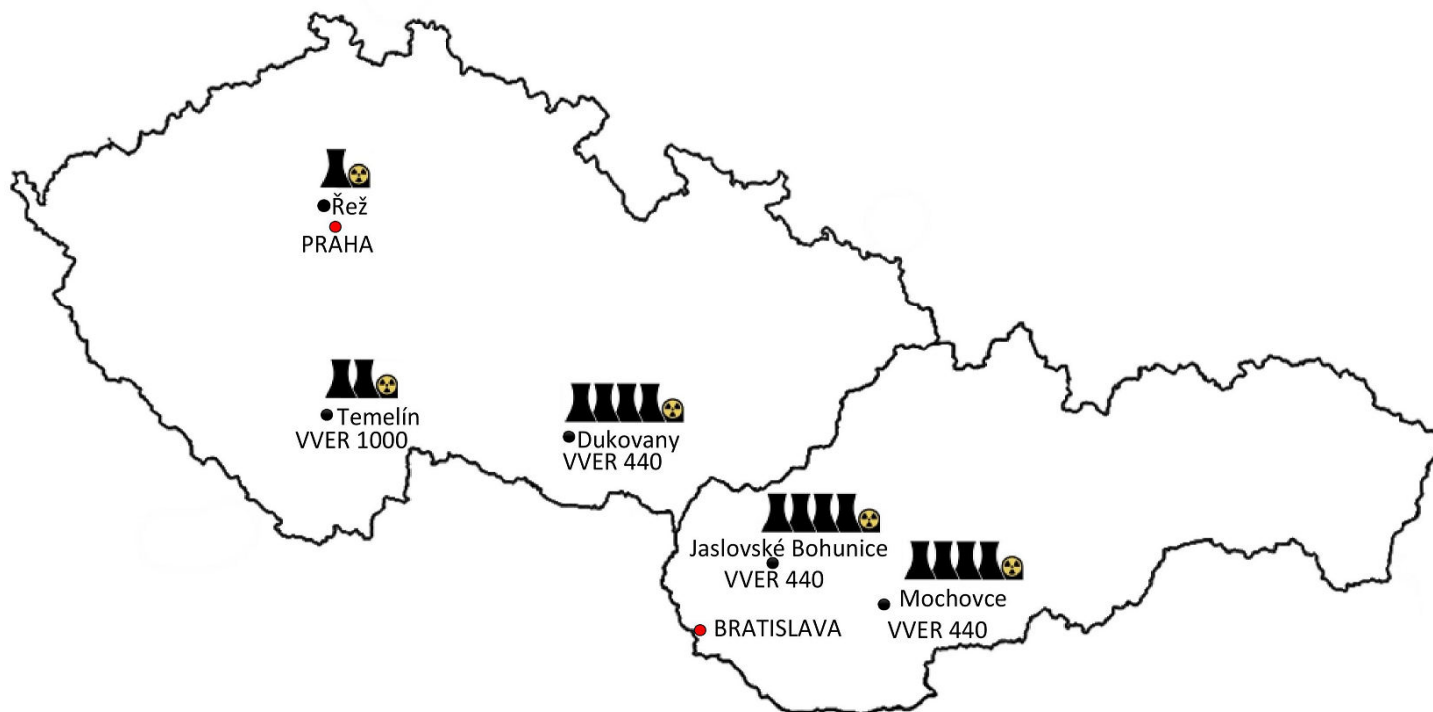


- «EGP INVEST» cooperates with the number of well-known design companies in Czech Republic, Europe and Russian Federation. Among our partners - Swedish engineering company AF Consult, Czech companies FANS (cooling water supply), Skoda JS, BHM (Austria), Russian company «ATOMPROEKT», etc.



## 2. History of cooperation of «EGP INVEST» with Russian design institutes

- Cooperation with Russian design companies is related with the implementation of Czech-Slovakian nuclear program. Cooperation was made within the construction of VVER type NPPs in Jaslovske Bohunice, Mochovce (Slovak Republic), Dukovany and Temelin (Czech Republic).



## 2. History of cooperation of «EGP INVEST» with Russian design institutions.

- I would like to emphasize, that the design activities, including the development of Nuclear Island for above mentioned NPPs, was made in the offices of «EGPI» in Uhersky Brod, Trnava and Prague.
- At present during the implementation of the project of construction of the civil part of Nuclear Island of the 3&4 units of NPP Mochovce, which is carried out by Italian company «ENEL», our specialists use the original design documentation, prepared by the company «ЛОТЭП» in Leningrad city many years ago.

### 3. New stage of cooperation – «EGP INVEST» - JSC «ATOMPROEKT».



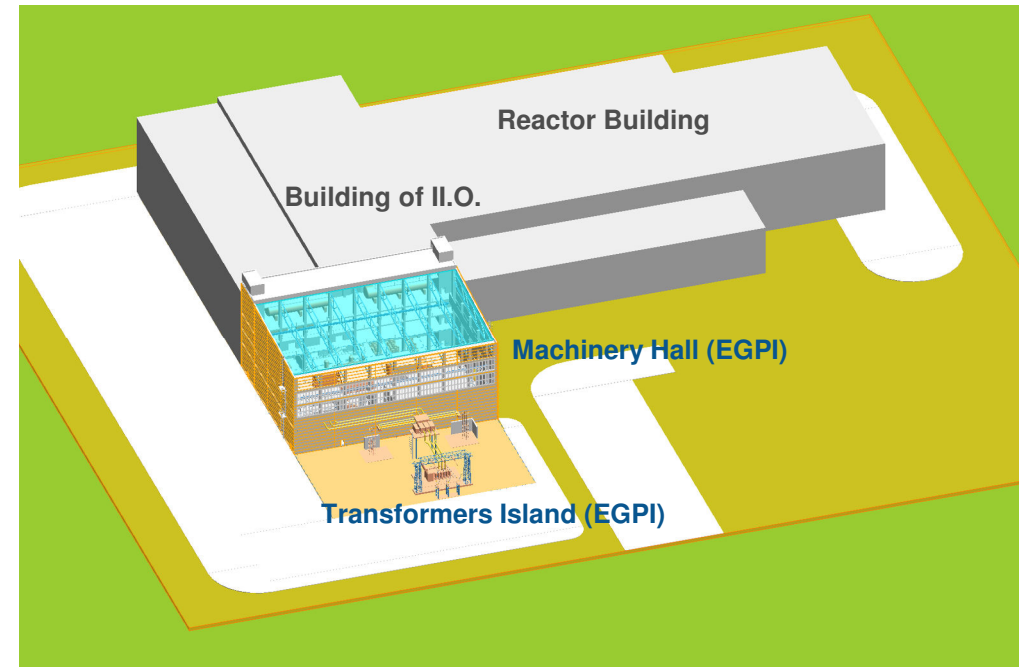
- 
- In recent years «EGP INVEST» management made a decision to use the long-term experience and to sign new cooperation agreement with Russian design companies.
  - It is logical, that our company demonstrated the interest to the direct cooperation with the Research and Development and design institution JSC «ATOMPROEKT».

## 4. Participation of «EGP INVEST» in MBIR project

After several sets of negotiations EGP INVEST managed to take part in the preparation of the design documentation as sub-contractor.

The scope of responsibility of «EGP INVEST» included the realization of the design documentation for the turbine hall of multi-purpose research reactor MBIR, the construction of it is done in the city Dmitrovgrad in Russian Federation. Project investor is State Corporation ROSATOM, this project is international.

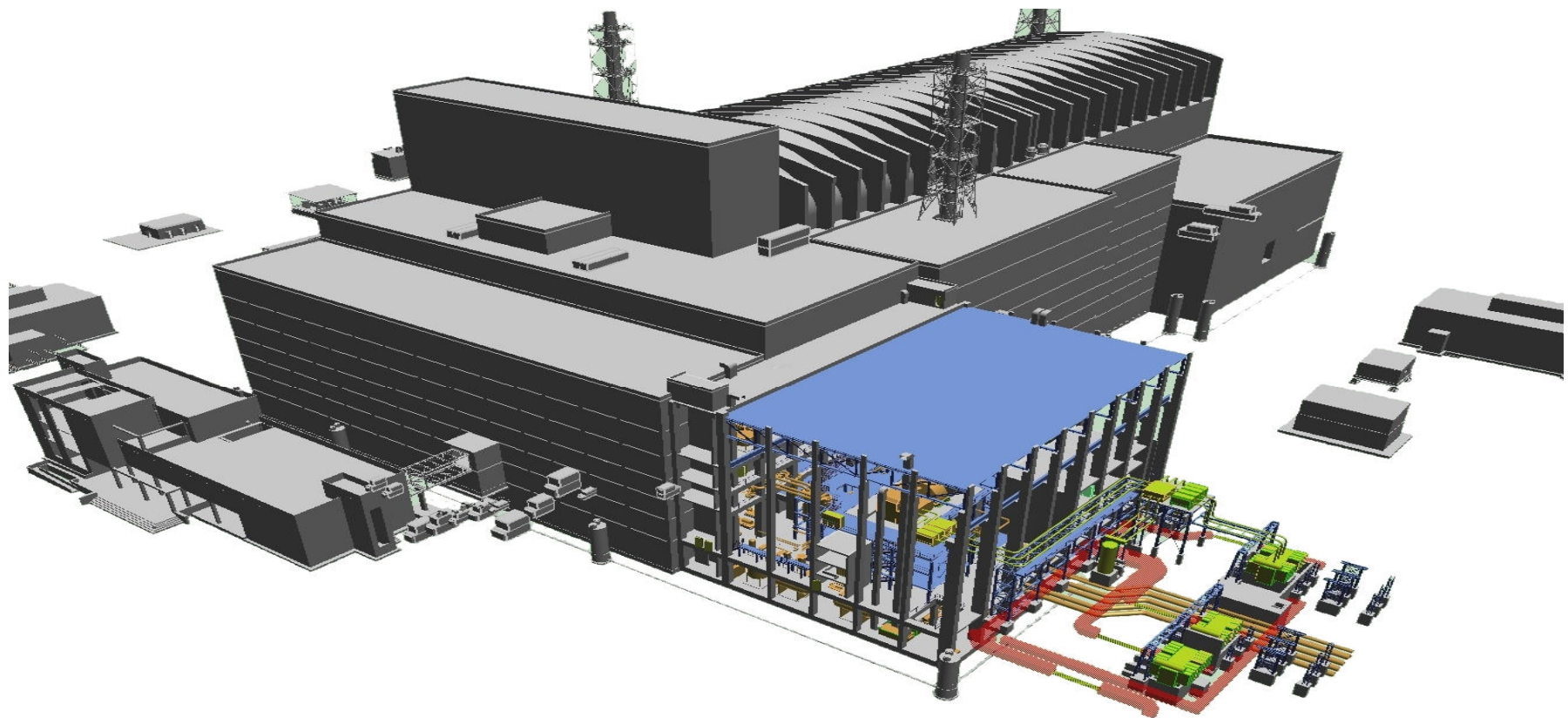
Direct investor is the company NIAR, preparation of design documentation is made by «ATOMPROEKT», Saint Petersburg.





## 4. Participation of «EGP INVEST» in MBIR project

From the technical point of view it was necessary to realize the complete design activities, the task of Czech specialists was to develop the design documentation at the level of basic design in accordance with the Russian norms and standards, as the design documentation should be submitted for approval to relevant bodies in RF for state examination.



### 4.1 Sequence of implementation of basic design for MBIR project - turbine hall

- At the beginning of the project there were conducted at different stages of the project technical consultations in Saint-Petersburg, Moscow, Prague and Uhersky Brod. The program of negotiations was prepared before – hand, within the process of negotiations JSC «ATOMPROEKT» invited for cooperation a number of other Russian companies, and «EGP INVEST» took part in the negotiations together with the company «TASMO».
- Main documents, which allowed to coordinate the process, were minutes of meetings, the necessary conditions for successful work were recorded there.

### 4.2 Advantages of «EGPI» participation in preparation of technical project MBIR

- From technical point of view the process of preparation of design documentation in accordance with Russian norms and standards was rather complicated and required additional skills and knowledge.
- Accordingly, we can say that at present the experience, gained during the projects implementation, our company can use both in further activities in Russia, and during cooperation with other Czech companies, which are working at the territory of the Russian Federation.
- I would like to emphasize, that our design specialists worked out the necessary structure and stages of preparation of the Russian design documentation, and found technical differences in several design stages and functions.

## 4.3 Coordination of 3D design model

- Within MBIR project implementation it was necessary to prepare several part of documentation in 3D model and SW Smart Plant.

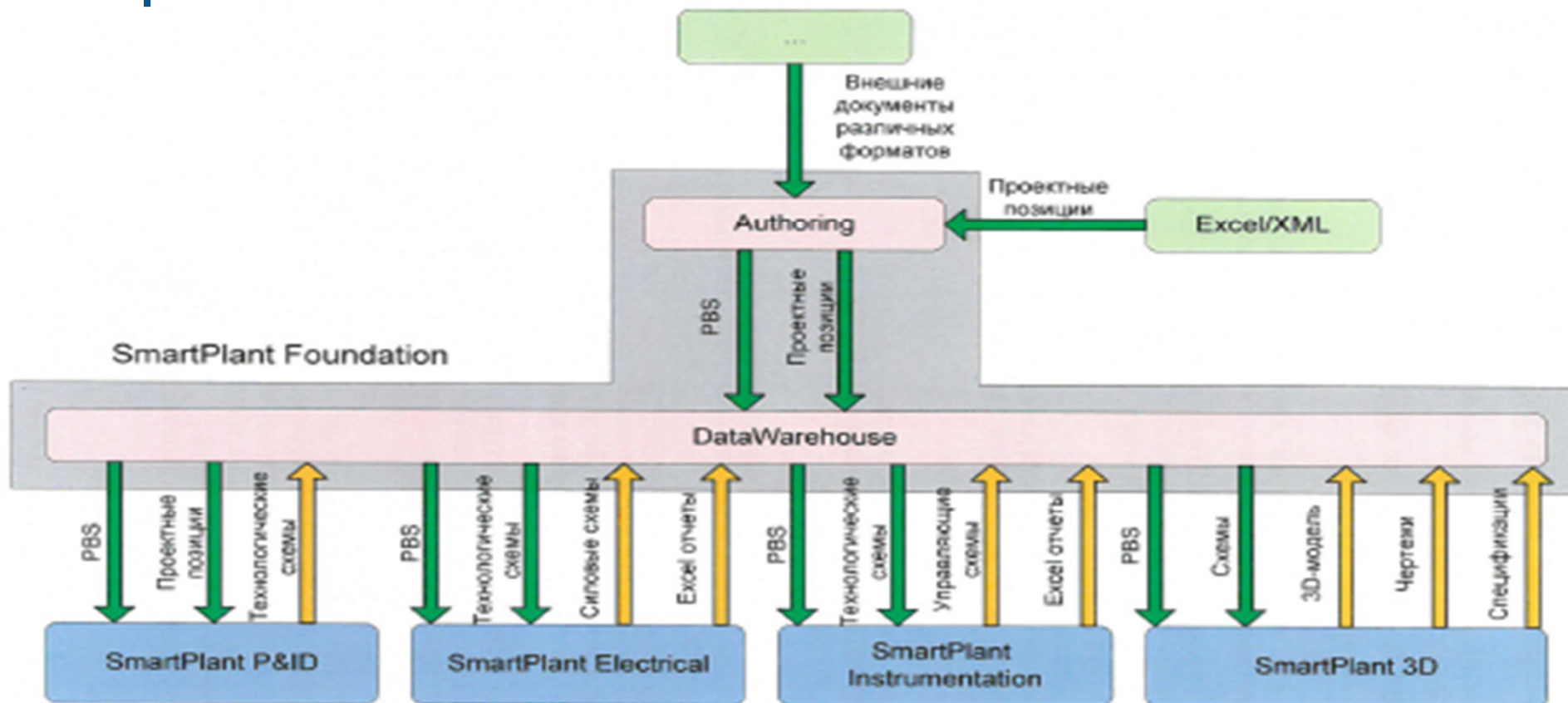
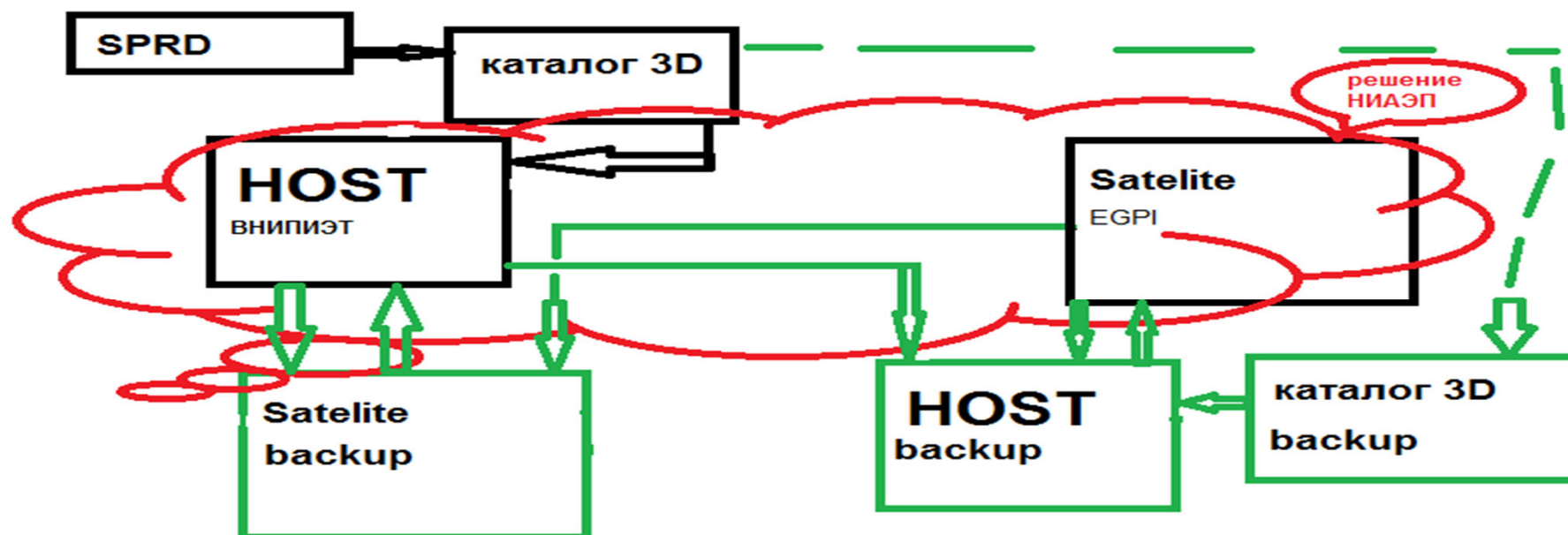


Рисунок 3.1 – Архитектура взаимодействия элементов SP по передаче проектных данных

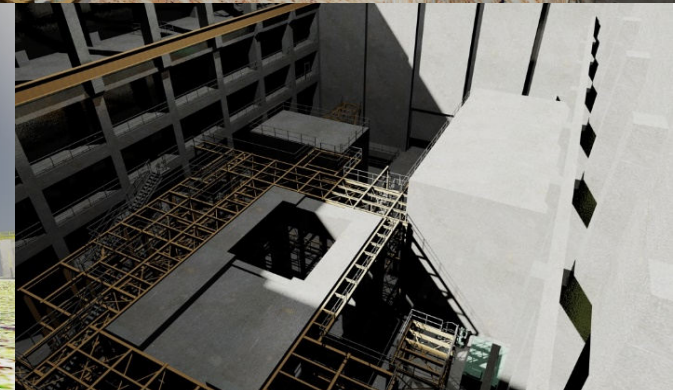
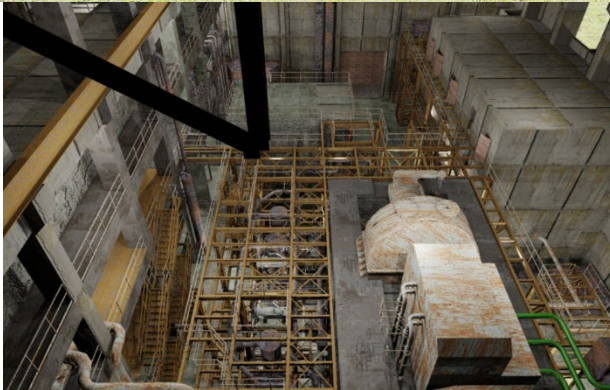
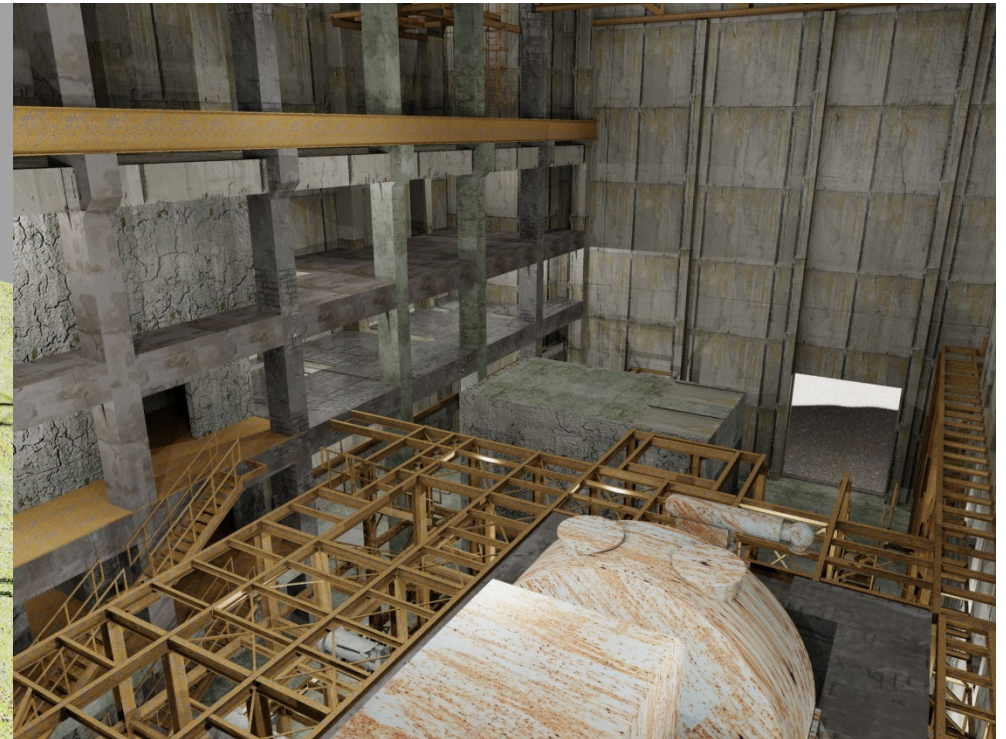
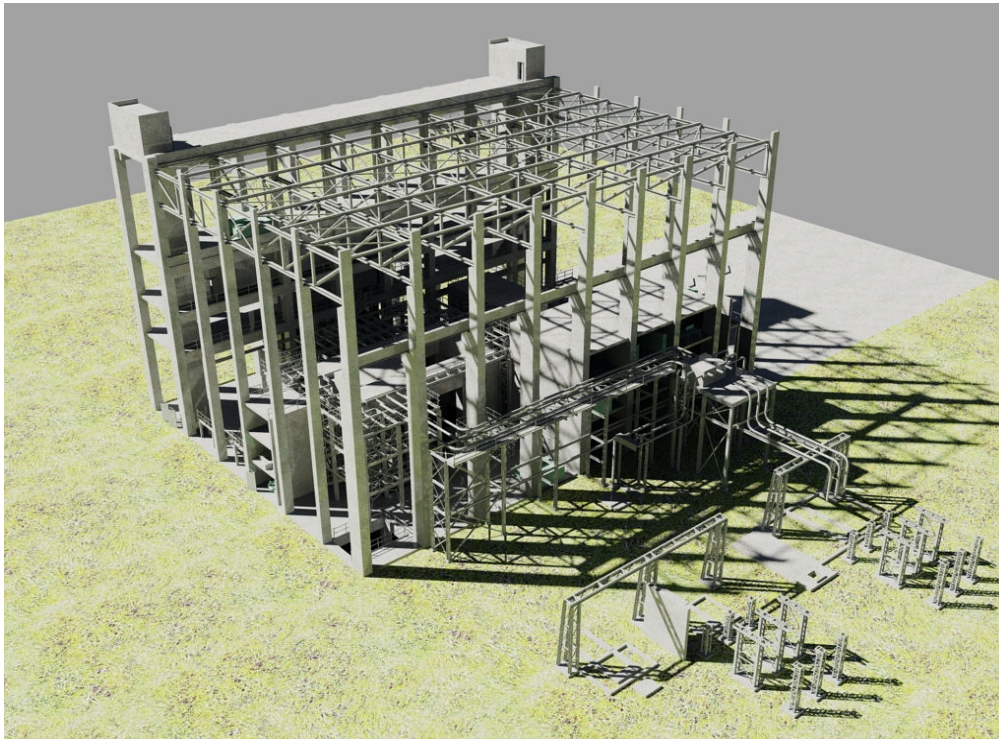
### 4.3 Coordination of 3D design model



- We consider, that we were successful in coordination and regulation of above mentioned software, and at present both companies, «EGPI» and JSC «ATOMPROEKT» have the opportunity to exchange the information online by means of 3D design model.

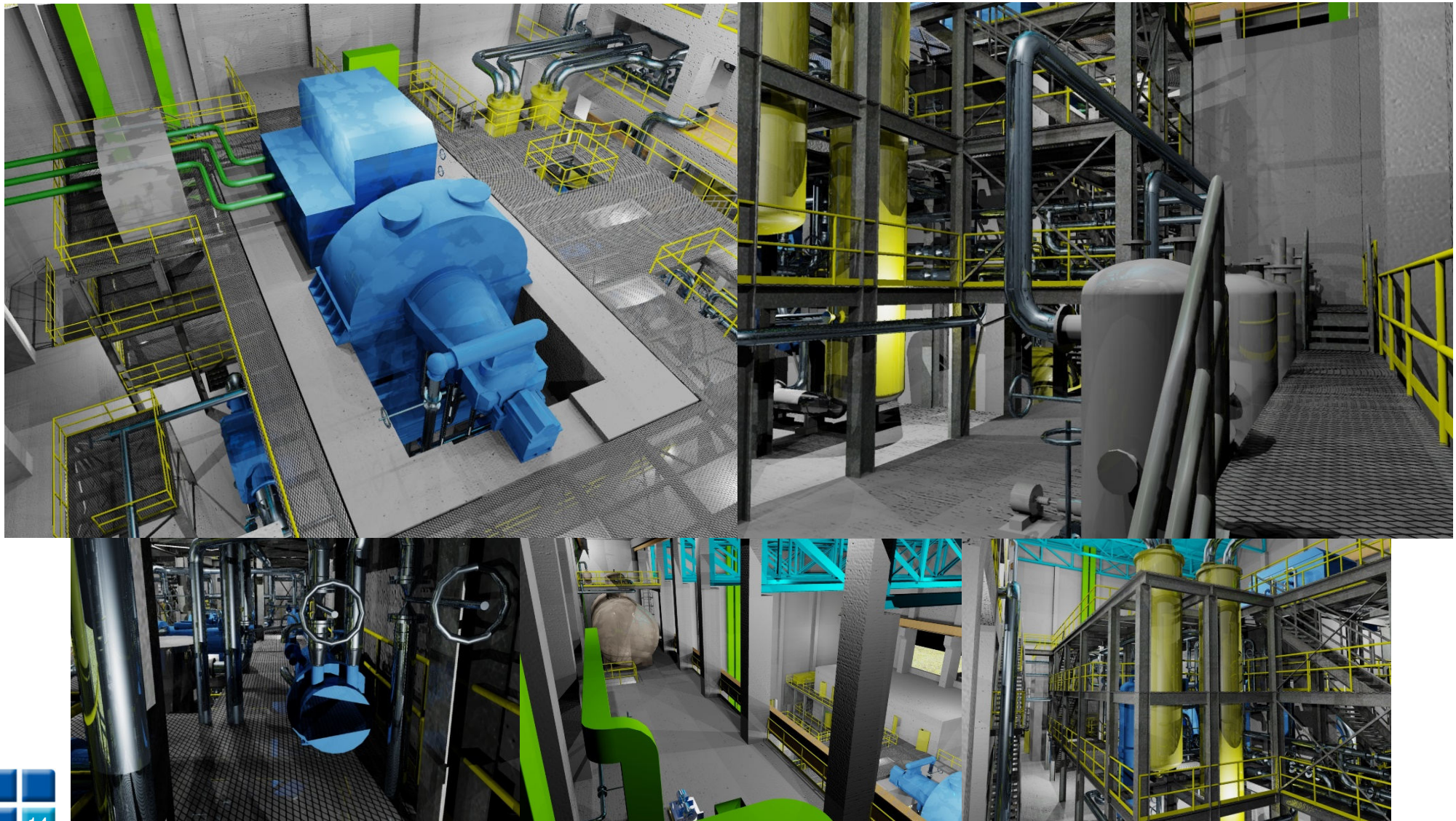
## 4.3

## Coordination of 3D design model



## 4.3

## Coordination of 3D design model



## 5. Other forms of cooperation between «EGPI» and JSC «ATOMPROEKT».

- Within the cooperation on MBIR project in 2014 the company management organized mutual workshops for specialists on agreed topics. The main topic of workshop was the nuclear energy, also the problems of decommissioning of NPPs and nuclear waste management were discussed.
- The separate topic was the classical energy, including reconstruction of power stations, and alternative sources of energy, for instance, hydro power plants.
- Those workshops bring value for both companies, that is why it was decided to conduct further seminars.



## 6. Results of the mutual cooperation between «EGP INVEST» and JSC «ATOMPROEKT»



### Within the recent years the companies have reached the following results :

- The companies made sure the mutual cooperation in the field of engineering and design brings value.
- Based on the experience, gained during the implementation of MBIR project, the company «EGPI» is ready to the mutual cooperation in the field of design, mainly on the projects of construction of the new units under the Russian technology in third countries, where our company may apply the knowledge in accordance with the Russian norms and standards and acting EU legislation.
- The companies have the opportunity to implement mutual projects in the field of nuclear waste management, and are open to invite highly qualified specialists for participation in working groups and mutual workshops.

## 6. Results of the mutual cooperation between «EGP INVEST» and JSC «ATOMPROEKT»

### Соответствие с действующими нормами и стандартами ЕС:

#### Russian Federation

ГОСТ	State Standard
ГОСТ Р	Russian State Standard
СНиП	Construction norms and rules
СП	Code of design rules
СН	Construction norms
МДС	Methodical documents in construction
РДС	Main documents in construction

#### EU, Czech Republic

EN	European Standard
ISO	International Standard
EN ISO	International Standard, adapted for European norms
ČSN	Czech Standard
ČSN EN	Czech Standard, adapted into the system of Czech state norms
ČSN EN ISO	Standard EN ISO, adapted into the system of Czech norms

### Documentation content and structure - Design documentation:

# 3 . Design documentation, content and structure

## Russian Federation

### Decree №. 87 About the content of design documentation and requirements to it

Section 1 "Explanatory note"

Section 2 "Scheme of planning of the land parcel"

Section 3 "Archititectoral solutions"

Section 4 "Design and global planning solutions"

Section 5 "Engineering equipment data, data about technical supply, list of engineering and technical events, content of technological solutions"

- a) subsection "Electrical power system";
- b) subsection "System of water supply";
- c) subsection "Drainage system";
- d) subsection "Heating and air conditioning, heating networks";
- e) subsection "Network communications";
- f) subsection "Gas supply system";
- g) subsection "Technological solutions".

Section 6 "Project of construction organization"

Section 7 "Project of organization of demolition of construction objects"

Section 8 "List of environment protection activities"

Section 9 "List of fire safety activities"

Section 10 "Activities for invalid persons access"

Section 10\_1 "List of rules for energy efficiency requirements and requirements of buildings equipment, procuring of used energy sources for the existing buildings"

Section 11 "Budget for construction of capital construction objects"

## EU, Czech Republic

### Regulation №. 499/2006 Sb., On construction documents

A The covering letter

B The general technical letter

C The situation plan

D Object documentation of technical equipment

D.1 Documentation of construction or engineering objects

D.1.1 Architecture and construction decision

D.1.2 Construction and design engineering decision (Statistical and dynamic calculation are an integral part)

D.1.3 Decision of the fire safety

D.1.4 Equipment installations

- sanitary-technical equipment,
- air-conditioning system, heating and cooling,
- measurement and control,
- high voltage electrical engineering,
- Electronic communication and other.

,  
- электронные коммуникации и прочее.

D.2 Documentation for technological equipment

E Documents section

E.1 Main opinion, changes, resolution of official bodies

E.2 Point of view of owners of public transport and technical infrastructure

E.3 Geodetic studies for design activities are prepared in conjunction with other legal requirements

E.4 The project is prepared by specialist in the field of seismic survey

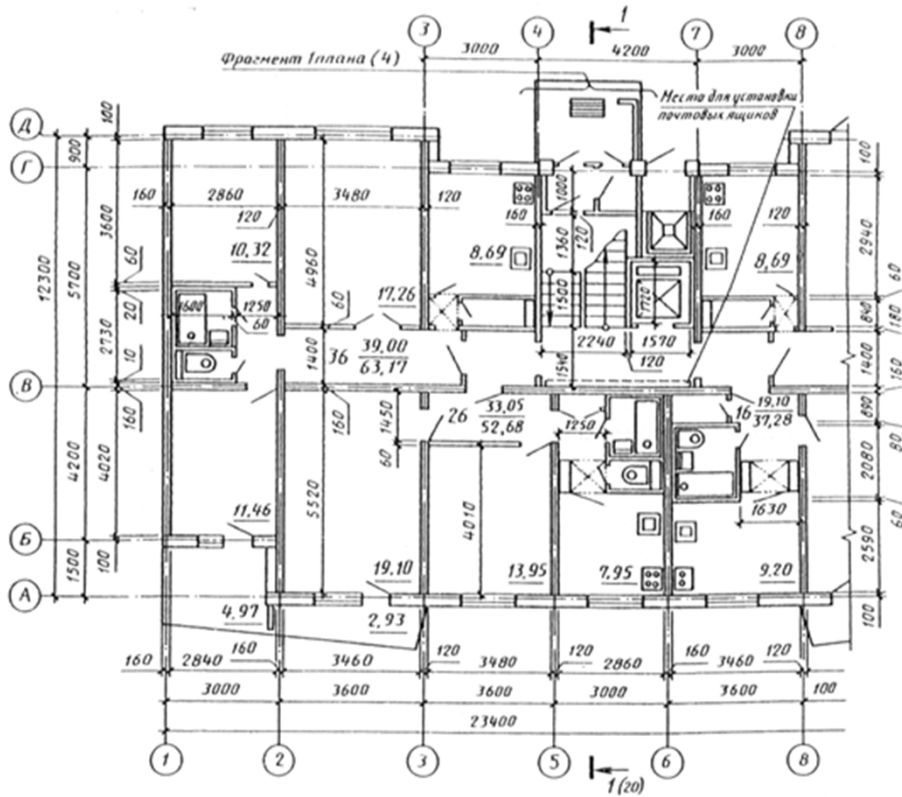
E.5 Energy efficiency card of the building I accordance with with the Law on energy management

E.6 Other opinions, solutions, fundings and consequences, which arose durring the preparation of documentation

# 6. Results of the mutual cooperation between «EGP INVEST» and JSC «ATOMPROJEKT»

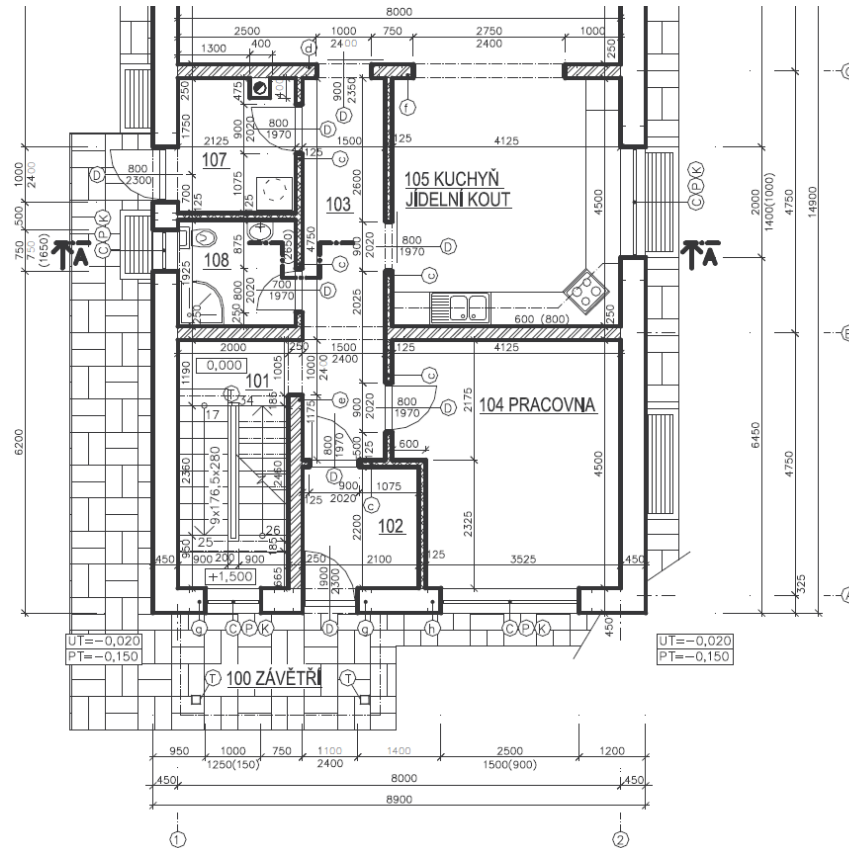
## Российская Федерация

ГОСТ 21.501—93 СПДС «Правила выполнения архитектурно-строительных рабочих чертежей»



## ЕС, Чешская республика

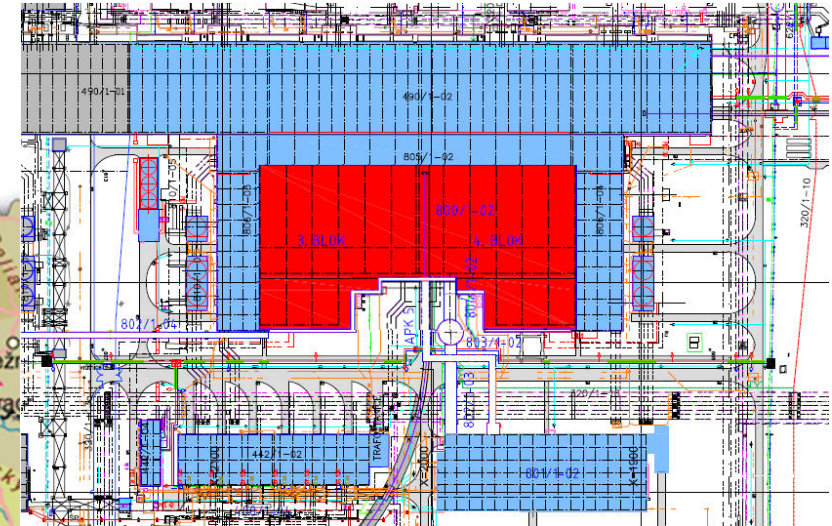
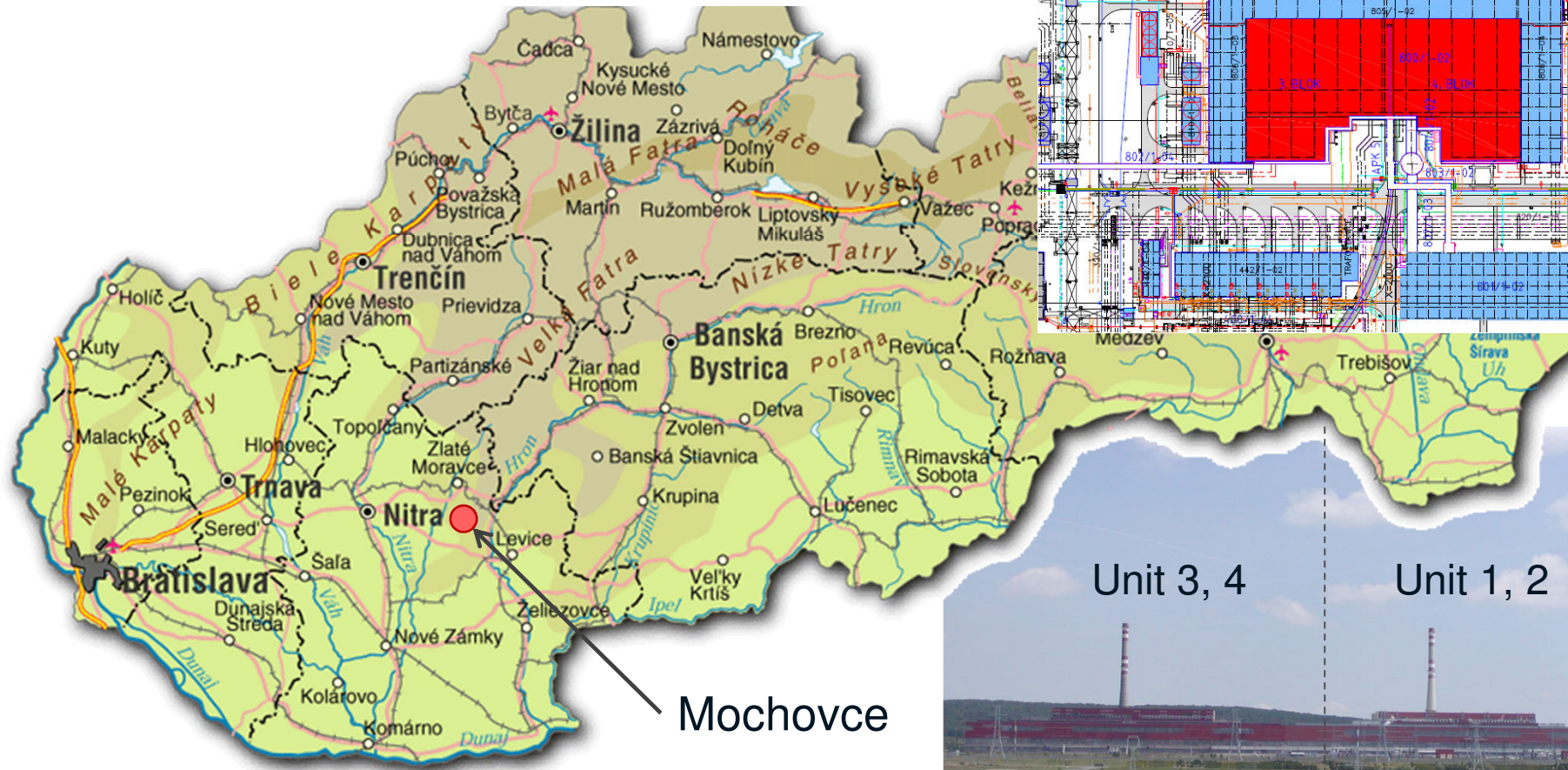
ČSN 01 3420 «Чертежи наземных объектов – Работа над чертежами строительной части»



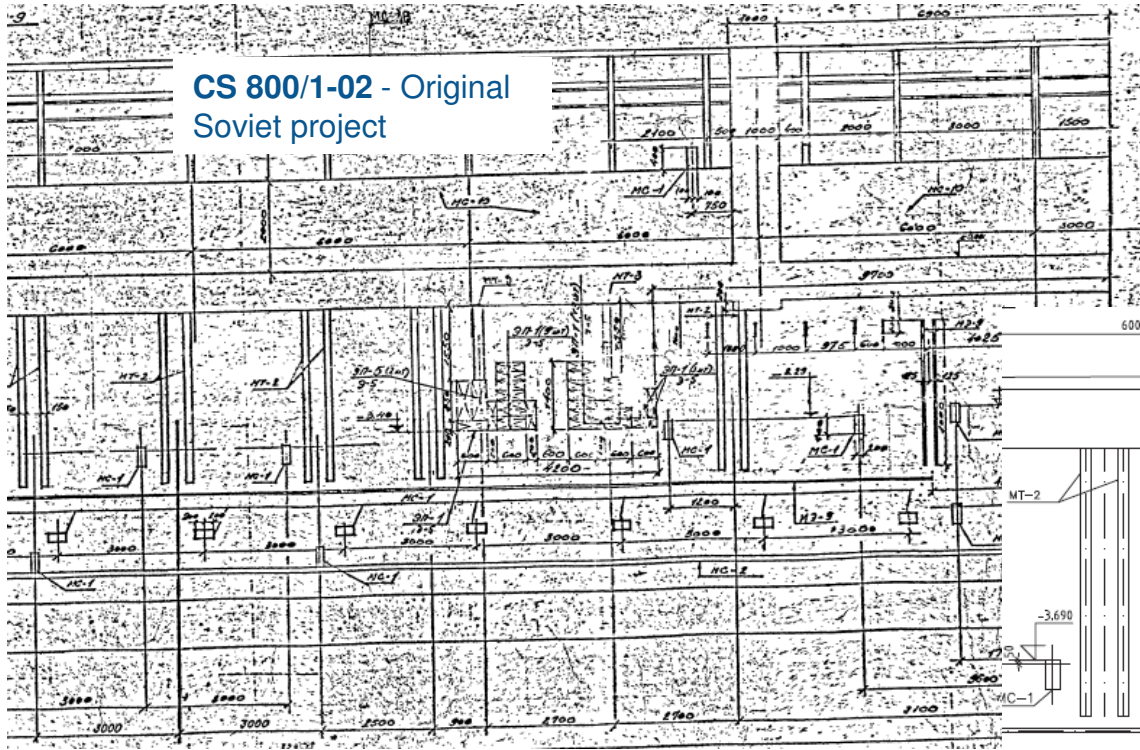
# 6. Results of the mutual cooperation between «EGP INVEST» and JSC «ATOMPROEKT»



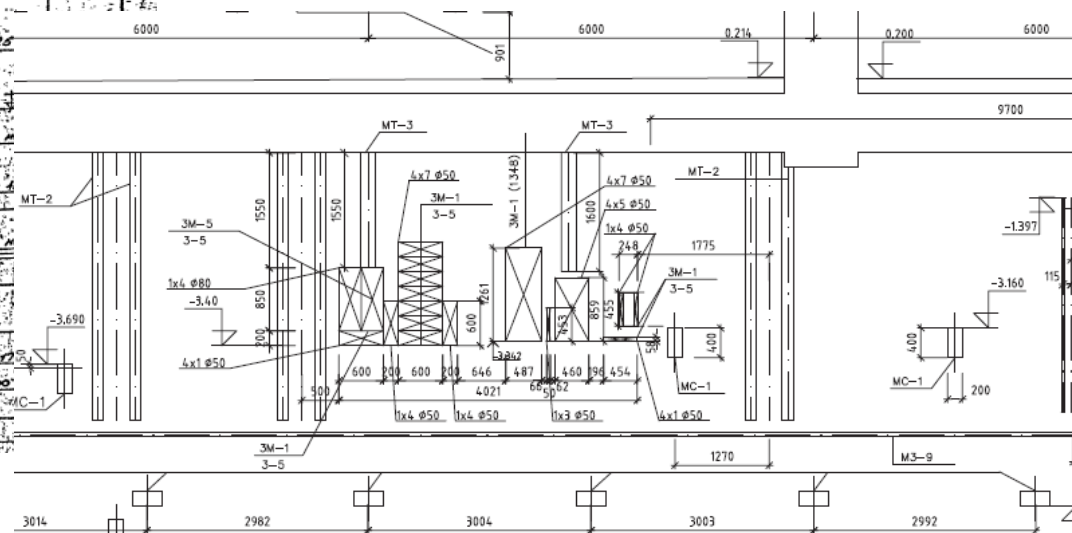
## Практический опыт – достройка АЭС Моховце 3,4 блоки в Словакии



# 6. Results of the mutual cooperation between «EGP INVEST» and JSC «ATOMPROEKT»



CS 800/1-02 – New drawing in compliance with Eurocode



Proj. Coordinates			Static load (kN)				Seismic										
DPV2	DPV3	DPV4	Zero No.	Zero letter	X (mm)	Y (mm)	Z (mm)	ST-Fx	ST-Fy	ST-Fz	ST-Mx	ST-My	ST-Mz				
PNM34301029	PNM34303252	PNM343068120	212	G	11000	33000	3500	0,00	0,00	-0,32	0,00	0,00	0,00				
PNM34301029	PNM34303252	PNM343068120	212	G	11000	36000	3500	0,14	0,00	-0,80	0,00	0,00	0,00				
PNM34301029	PNM34303252	PNM343068120	212	G	11000	33000	3150	0,74	0,00	-3,73	0,00	0,00	0,00				
PNM34301029	PNM34303252	PNM343068120	212	G	11000	36000	3150	0,00	0,00	-3,50	0,00	0,00	0,00				
PNM34301029	PNM34303252	PNM343068120	212	G	11000	36207	3075	0,70	0,12	-0,09	0,00	0,00	0,06				
PNM34301029	PNM34303252	PNM343068120	212	G	11000	36207	2736	0,70	-0,04	-0,42	0,00	0,00	0,01				
PNM34301029	PNM34303252	PNM343068120	212	G	11000	34264	2681	0,35	-0,07	-0,24	0,00	0,00	0,02				
PNM34301029	PNM34303252	PNM343068120	212	G	11000	33207	3075	-0,79	0,04	0,06	0,00	0,00	0,02				
PNM34301029	PNM34303252	PNM343068120	212	G	11000	33207	2681	0,79	0,02	-0,46	0,00	0,00	0,00				
PNM34301029	PNM34303211	PNM343068120	212	G	11000	33000	4075	0,00	0,00	-6,50	0,00	-2,60	0,00				
PNM34301029	PNM34306837	PNM343068120	212	G	11000	24000	-1750	0,00	0,00	6,00	0,00	2,40	0,00				
PNM34301029	PNM34306837	PNM343068320	212	G	43000	26400	-1300	-3,60	0,00	0,00	0,00	0,00	0,00				
PNM34301029	PNM34306837	PNM343068320	212	G	43000	26300	-1300	-3,40	0,00	-3,50	0,00	0,00	0,00				
PNM34301029	PNM34306837	PNM343068320	212	G	43000	26400	-1300	-3,60	0,00	-3,50	0,00	0,00	0,00				
PNM34301029	PNM34303211	PNM343068120	212	G	11000	25275	2500	0,00	1,30	-6,00	2,40	6,00	0,00				
PNM34301029	PNM34303211	PNM343068120	212	G	11000	25275	2500	0,00	0,00	-6,50	0,00	-2,60	0,00				
PNM34301029	PNM34303211	PNM343068120	212	G	11000	27000	4100	1,30	0,00	-2,40	6,00	0,00	0,00				
PNM34301029	PNM34306837	PNM343068120	212	G	11000	25100	-1200	-1,00	0,00	-0,00	0,00	2,40	0,00				
PNM34301029	PNM34306837	PNM343068120	212	G	11000	25950	-1750	-1,00	0,00	-6,50	0,00	-2,60	0,00				
PNM34301029	PNM34306837	PNM343068320	212	G	43000	26400	-1350	0,00	0,00	-6,50	0,00	-2,60	0,00				
PNM34301029	PNM34306837	PNM343068320	212	G	43000	26300	-1350	0,00	0,00	-6,50	0,00	-2,60	0,00				
PNM34301029	PNM34306837	PNM343068120	212	G	11000	25300	-1200	-1,00	0,00	-0,00	0,00	2,40	0,00				
PNM34301029	PNM34303211	PNM343068120	212	G	11000	24400	8765	0,00	0,00	-6,50	0,00	-2,60	0,00				
PNM34301029	PNM34308429	PNM343084651	212	G	11000	17350	-2542	ENSFCO	Staticke a seis 250x150	1b	81	85	412	80,1	82	83	
PNM34301029	PNM34308429	PNM343084651	212	G	11000	17350	-2542	ENSFCO	Staticke a seis 250x150	1b	81	85	412	80,1	82	83	
PNM34301029	PNM34308429	PNM343084651	212	G	11000	14350	-2350	ENSFCO	Staticke a seis 300x150	1b	1,30	19,4	-23,40	14,1	-19,30	17,6	
PNM34301029	PNM34308429	PNM343084651	212	G	11000	18000	-5460	ENSFCO	Staticke a seis 400x200	1b	80,3	80,3	-1,00	0,00	-0,30	80,2	
PNM34301029	PNM34308429	PNM343084651	212	G	11000	15035	-5460	ENSFCO	Staticke a seis 400x200	1b	80,3	80,3	-1,00	0,00	-0,30	80,2	
PNM34301029	PNM34308429	PNM343084651	212	G	11000	25345	-3635	ENSFCO	Staticke a seis 300x300	1b	0,00	0,00	0,00	0,00	3,50	0,00	
PNM34301029	PNM34308429	PNM343084651	212	G	11000	24740	-5247	ENSFCO	Staticke a seis 300x300	1b	11,9	11,9	0,00	-6,20	80,7	-4,40	11,2
PNM34301029	PNM34308429	PNM343084651	212	G	11000	24150	-1430	ENSFCO	Staticke a seis 300x150	1b	80,6	80,6	-2,80	0,00	-1,10	80,5	

CS 800/1-02 – Example of database

## 7. Potential opportunities for mutual international cooperation

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**Despite difficult time, the management of EGP INVEST counts for the future cooperation and participation in new and interesting projects at the territory of Russian Federation and in third countries, including EU.**

**We would like to thank the employees of State Corporation Rosatom, JSC ATOMPROEKT, and other Russian design and research institutions, which helped us to find new opportunities for design activities and to gain new experience in Russia.**

# Thank you for your attention

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