DEVELOPMENT OF ACHIMOV DEPOSITS, URENGOY OIL, GAS, CONDENSATE FIELD

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OF GAS CONDENSATE, OIL
GAZPROM DOBYCHA URENGOY LLC

GENERAL INFORMATION ABOUT DEPOSITS OF BIG URENGOY

AREA is more than 5 000 km²
ca. 3000 wells
16 UKPGs for Cenomanian gas
5 UKPGs for Valanginian gas
2 oil production facilities
2 UKPGs for Achimov gas

EXTRACTED FROM THE START OF THE DEVELOPMENT:

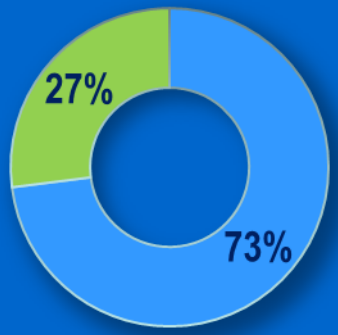
- 6,8 trln m3 gas
- 159 mm tonnes of gas condensate
- 14 mm tonnes of oil

CENOMANIAN DEPOSITS
VALANGINIAN DEPOSITS
ACHIMOV DEPOSITS

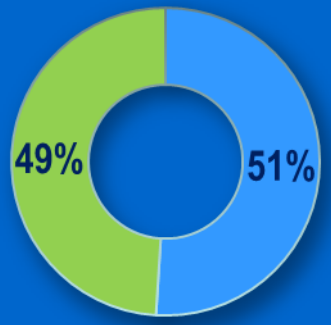
GAS RESERVES OF THE CENOMANIAN, VALANGINIAN AND ACHIMOV DEPOSITS OF THE FIELDS OF GAZPROM DOBYCHA URENGOY LLC

RECOVERY OF RESERVES

Cenomanian

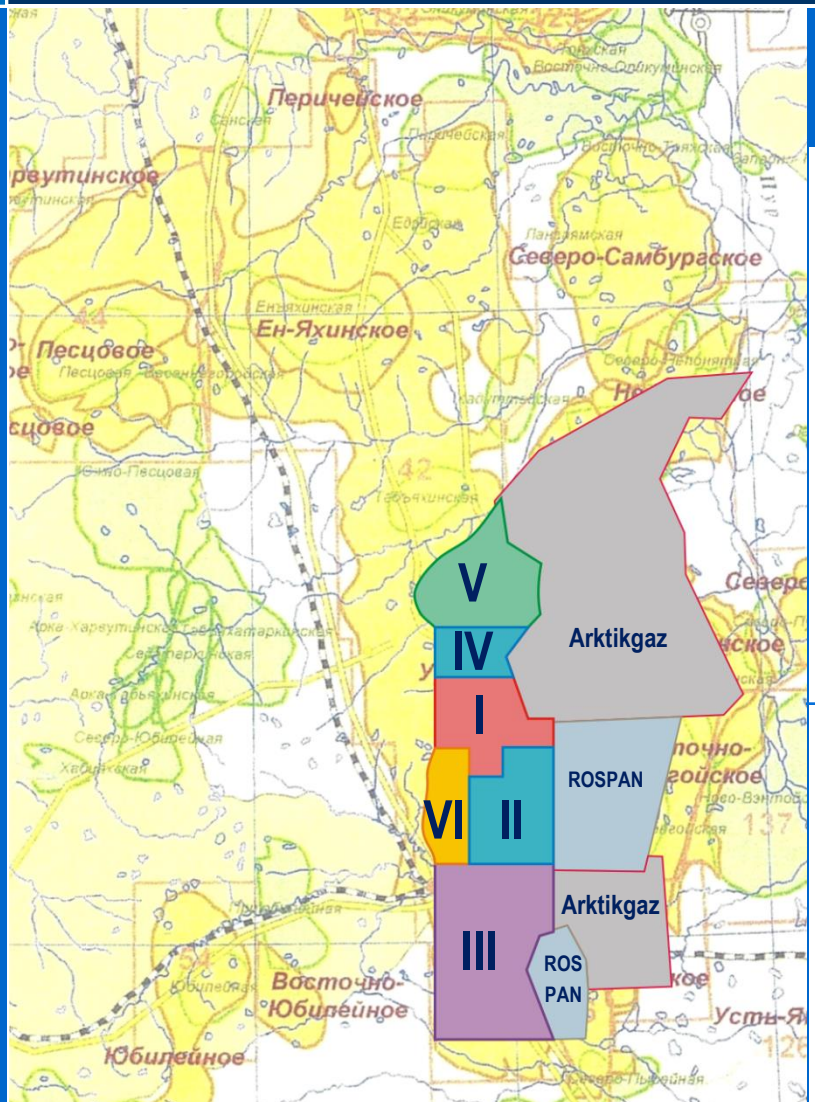


Valanginian

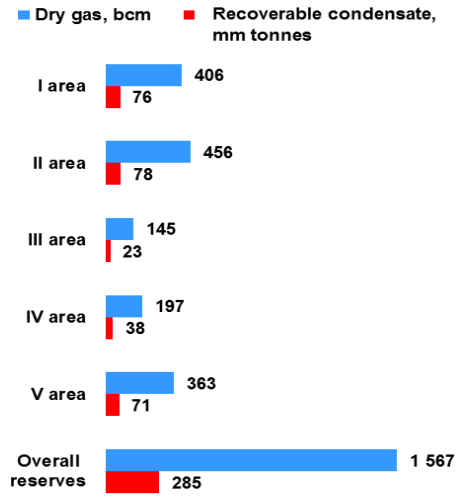


extracted reserves

current reserves



ACHIMOV DEPOSITS RESERVES (CATEGORIES A+B1)



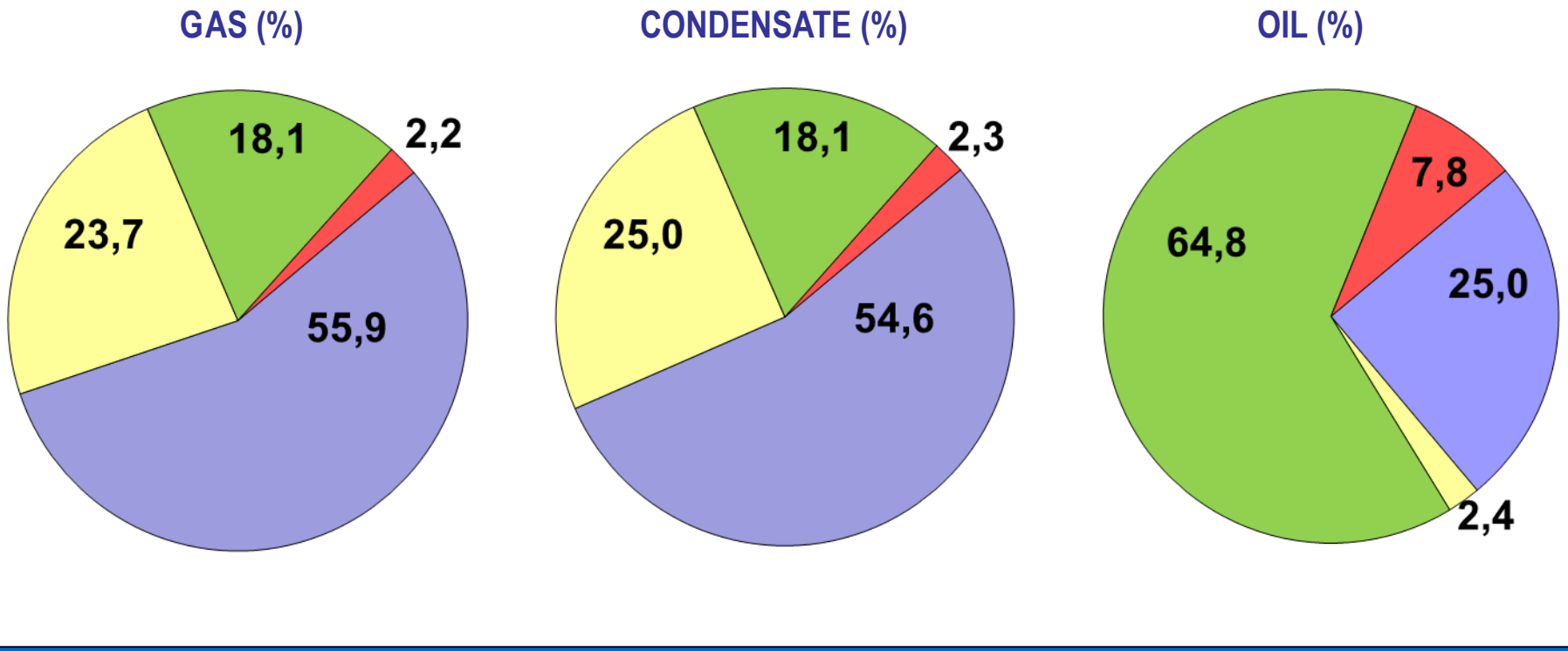
License blocks of Achimov deposits are owned by Gazprom dobycha Urengoy LLC:

Block I is developed by AO Achimgaz (Shareholders: Gazprom dobycha Urengoy LLC – 50%, Wintershall – 50%);

Blocks II, III , VI are developed by Gazprom dobycha Urengoy LLC;

Blocks IV, V are developed by LLC «Achim Development» (Shareholders: Gazprom - 74,99%, Wintershall – 25,01%).

DISTRIBUTION OF HYDROCARBON RESERVES OF ACHIMOV DEPOSITS AMONG SUBSOIL USERS

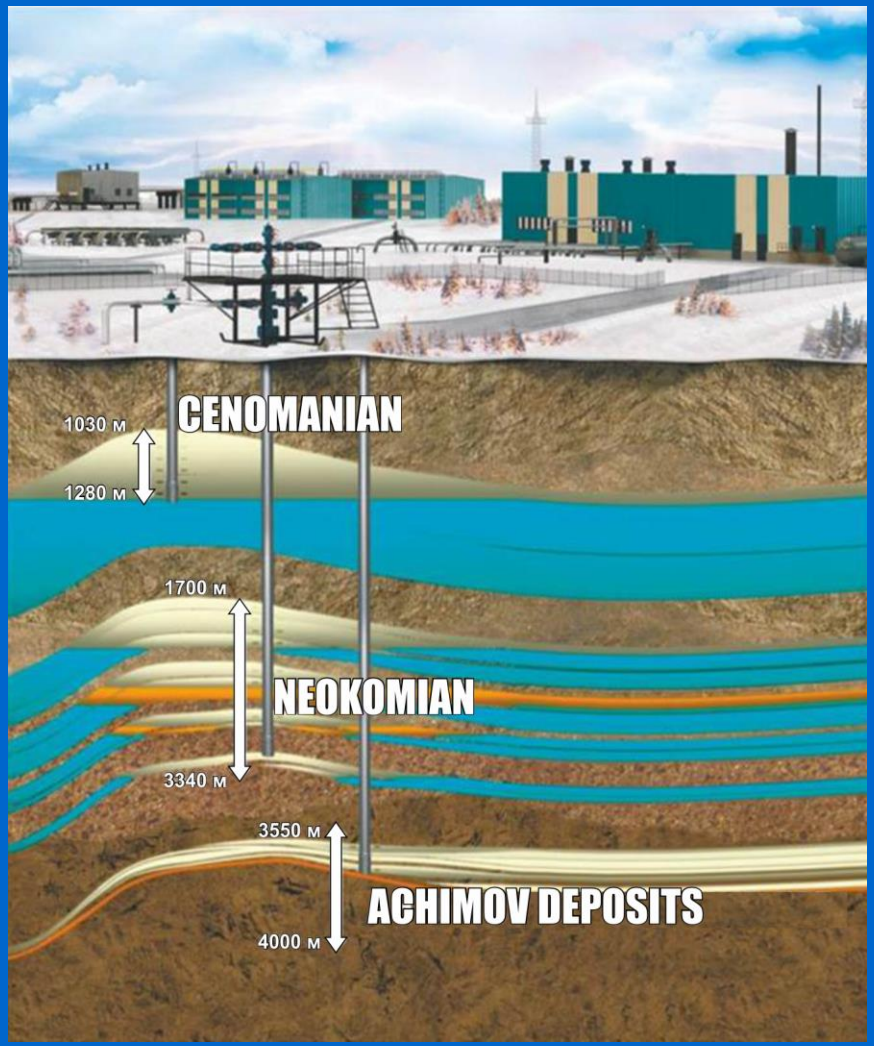


GAZPROM DOBYCHA URENGOY LLC owns:

- 56% reserves of dry gas
- 55% reserves of condensate
- 25% reserves of oil

- Gazprom dobycha Urengoy LLC
- ZAO Rospan
- OAO Arktikgaz
- Others

SPECIFICATIONS OF THE RESERVOIR SYSTEM OF ACHIMOV DEPOSITS



CENOMANIAN DEPOSITS

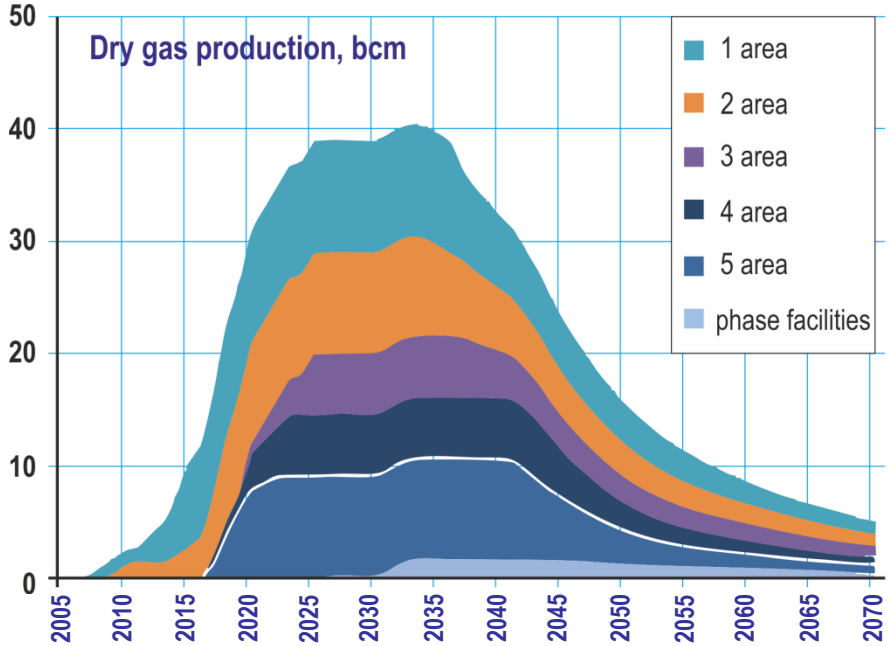
Depth, m	Formation pressure, MPa	Formation temperature, °C
1030-1280	~12,2	~31

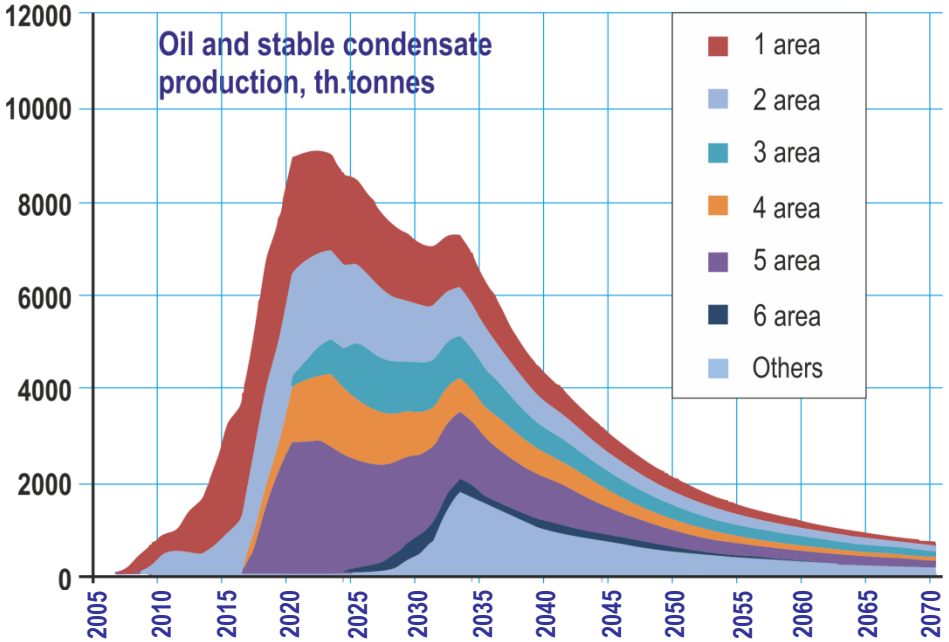
Depth, m	Formation pressure, MPa	Formation temperature, °C
1700-3340	~30	~75

ACHIMOV DEPOSITS

Depth, m	Formation pressure, MPa	Formation temperature, °C
3550-4000	~60	~106

DESIGN PERFORMANCE OF THE ACHIMOV DEPOSITS DEVELOPMENT, URENGOY FIELD (WITHIN LICENSE AREAS OF GAZPROM DOBYCHA URENGOY LLC)





BY 2025 TOTAL ANNUAL PRODUCTION OF HYDROCARBONS ON ACHIMOV AREAS WILL REACH:

- 40 bcm of separation gas
- 9 mm tonnes of liquid hydrocarbons

BY 2030 THE COMPANY WILL PRODUCE:

- 480 bcm of separation gas
- 110 mm tonnes of condensate

DEVELOPMENT OF ACHIMOV DEPOSITS
GAZPROM DOBYCHA URENGOY LLC

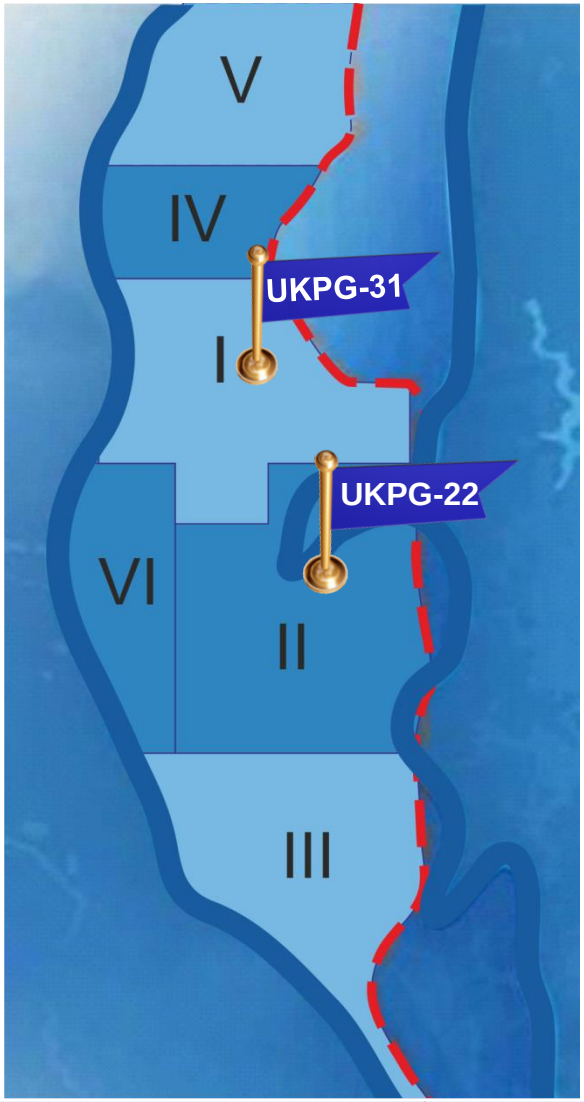
START OF THE ACHIMOV DEPOSITS DEVELOPMENT

UKPG-31

- **commissioning – 2008**
- **well stock – 82 units**

UKPG – 22

- **commissioning – 2009**
- **well stock – 45 units**



DEVELOPMENT PARAMETERS

I area:
- 111 wells
- design production – 10 bcm/year

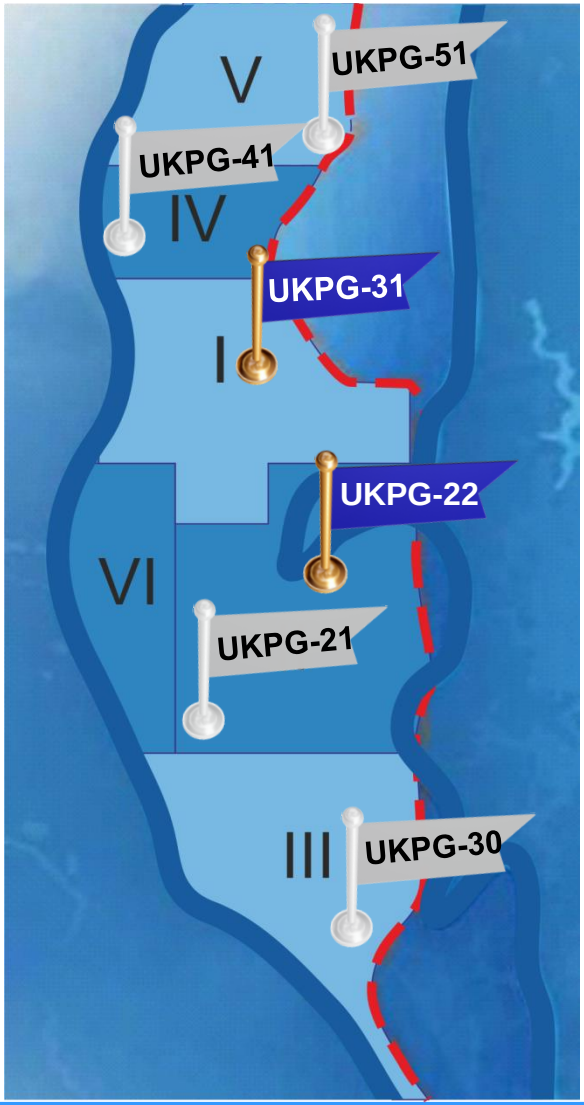
II area (expansion in 2019):
- 130 wells
- design production – 9,5 bcm/year

III area (after 2025):
- 97 wells
- design production– 5,5 bcm/year

IV area (commissioning in 2020-2021):
- 61 wells
- design production – 5,9 bcm/year

V area (commissioning in 2020-2021):
- 87 wells
- design production – 9,6 bcm/year

PROSPECTS FOR THE DEVELOPMENT OF THE ACHIMOV AREAS, URENGOY FIELD



I area:
(AO ACHIMGAZ)
- commissioning of 29 wells

II area:
- commissioning of 85 wells
- expansion of UKPG–22
- commissioning of UKPG–21

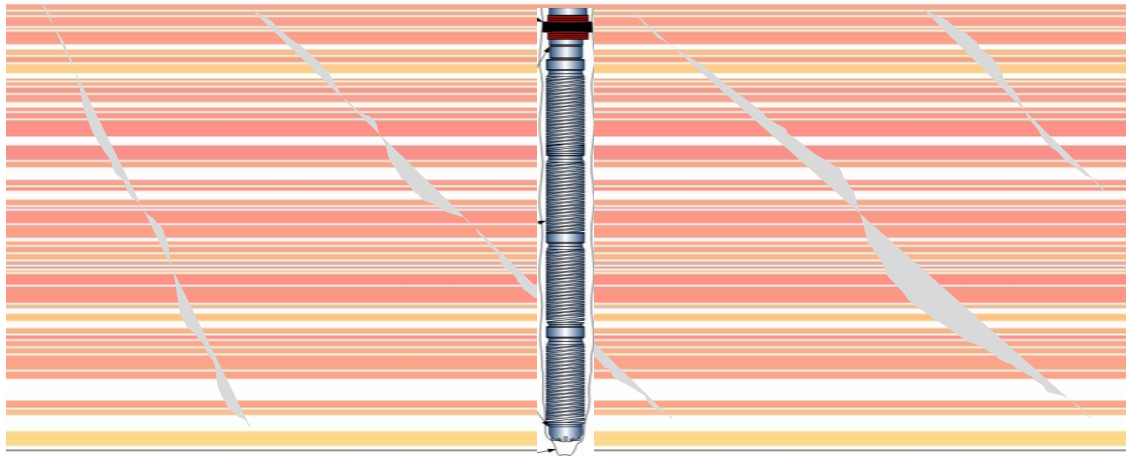
III area:
- commissioning of 97 wells
- commissioning of UKPG–30

IV area:
(LLC "Achim Development")
- commissioning of 61 wells
- commissioning of UKPG–41

V area:
(LLC "Achim Development")
- commissioning of 87 wells
- commissioning of UKPG–51

EVOLUTION OF THE WELL COMPLETION TECHNOLOGY. STAGES 1-2

1. VERTICAL DRILL-IN OF THE FORMATION



PROS:

Low cost of construction

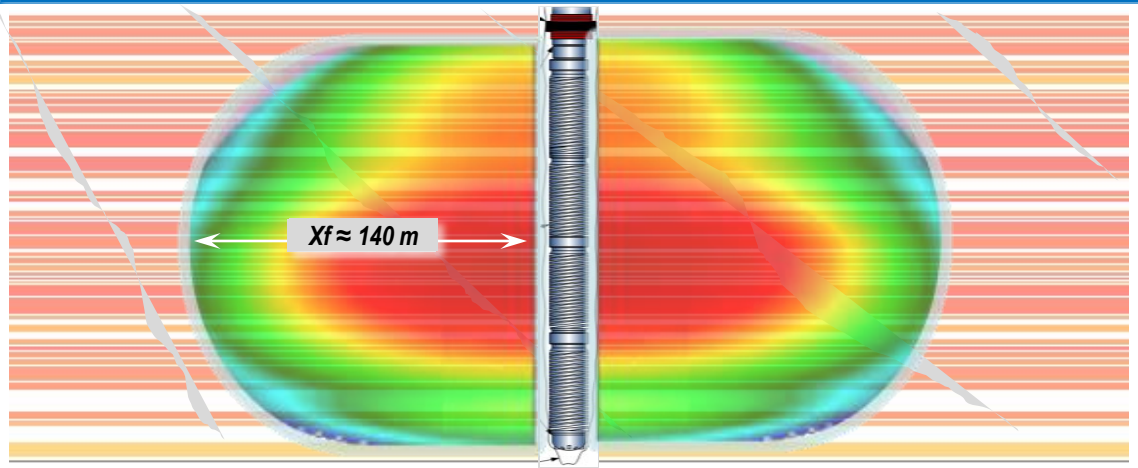
Opportunity to perform volumetric fracturing

CONS:

Low productivity

High draw-downs

2. VERTICAL DRILL-IN OF THE FORMATION + HYDROFRACTURING



PROS :

Proven technology

High and stable productivity

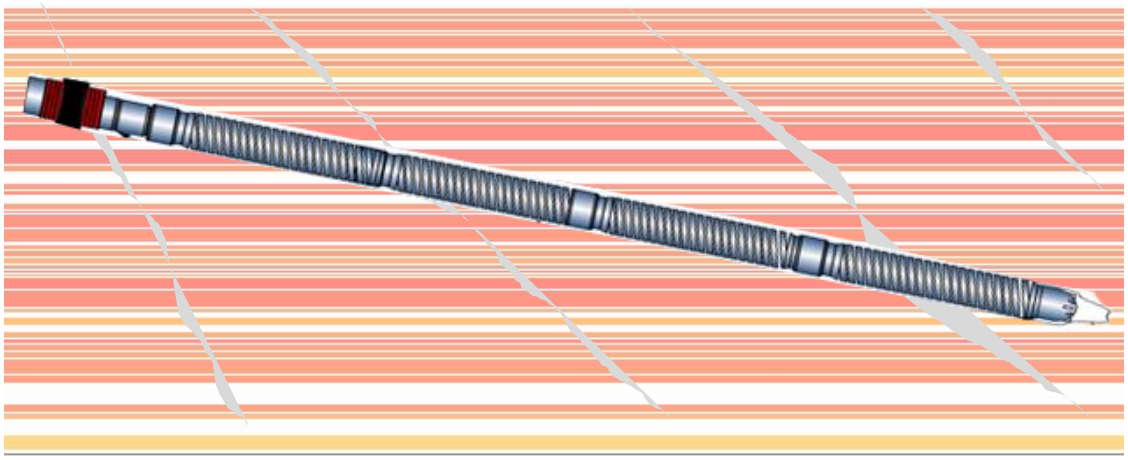
CONS :

Uncontrollable growth of vertical cracks

Small drainage area of the deposit

EVOLUTION OF THE WELL COMPLETION TECHNOLOGY. STAGES 3-4

3. HORIZONTAL WELLBORE



PROS:

Possible reduction of well stock

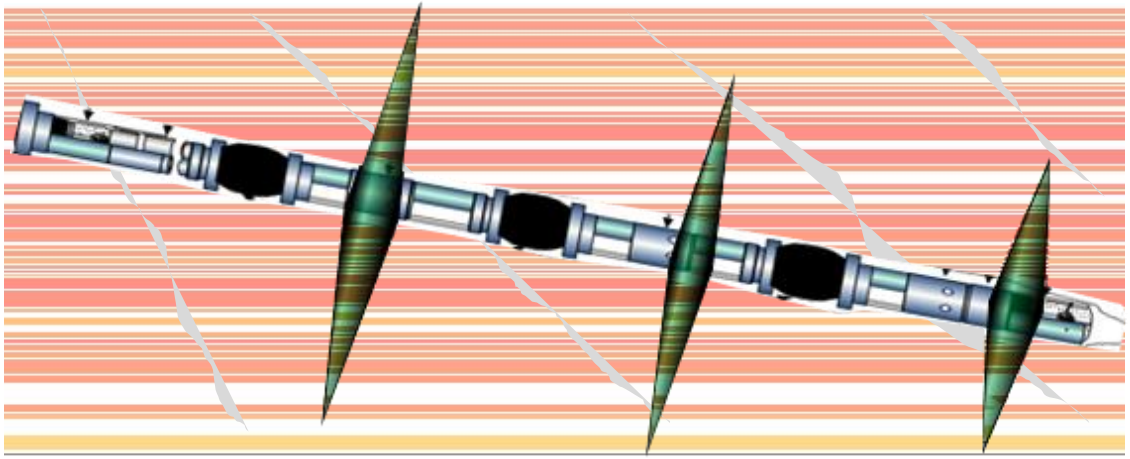
Remote zone connection

CONS:

High construction cost

High cost of studies

4. HORIZONTAL WELLBORE + MULTI-STAGE HYDROFRACTURING



PROS:

Possible reduction of well stock

Big drainage area

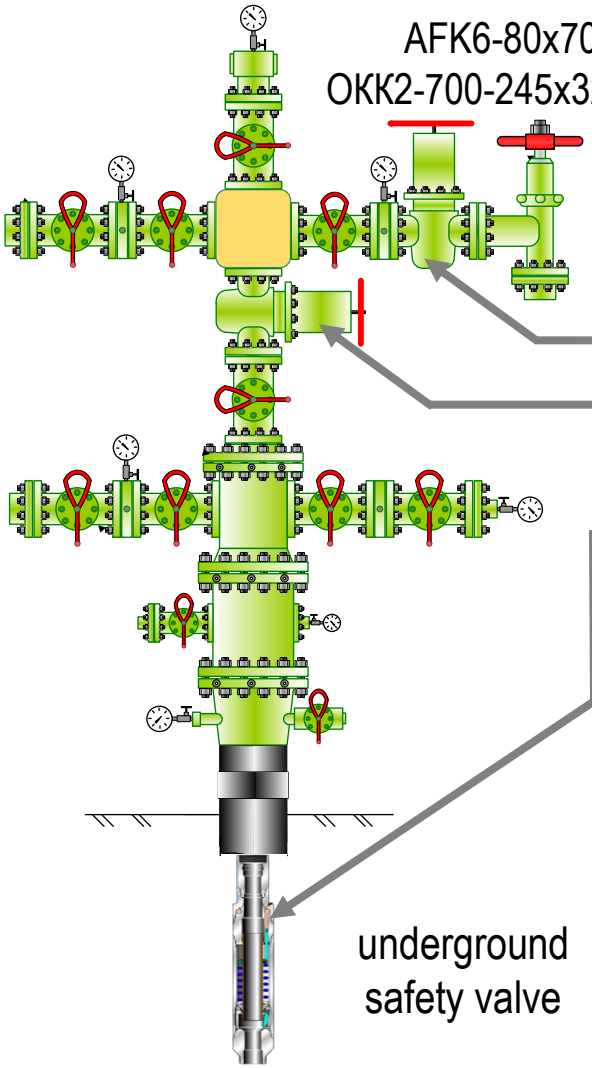
CONS:

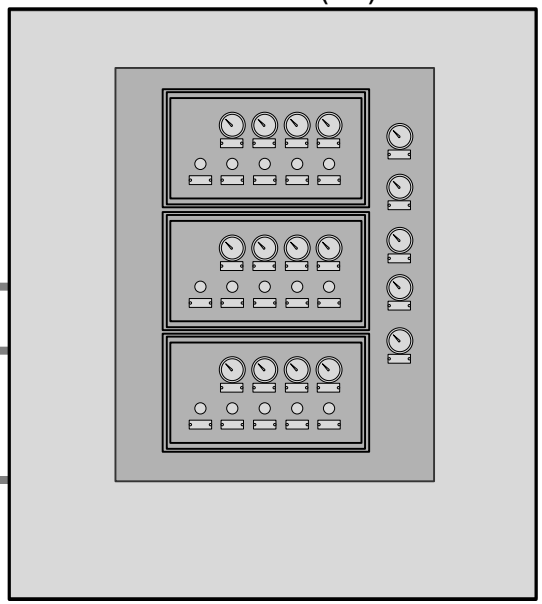
High construction cost

High cost of studies

A geomechanical model is needed

WELLHEAD PIPING OF A GAS CONDENSATE WELL

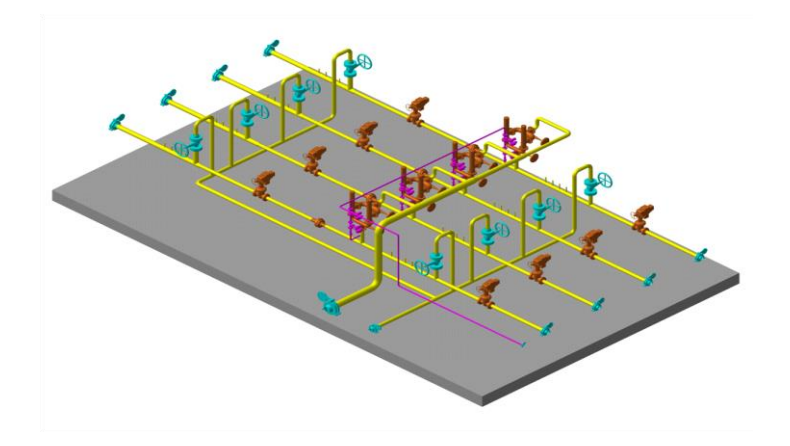




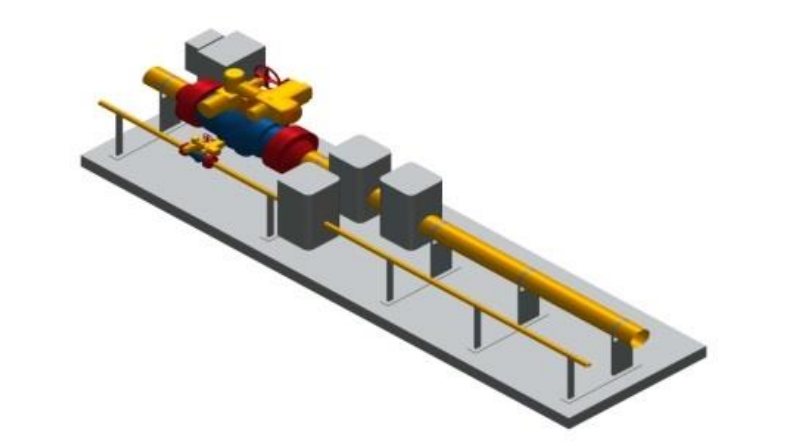
NOTE:

WV – wing valve
UMV – upper master valve
USV – underground safety valve

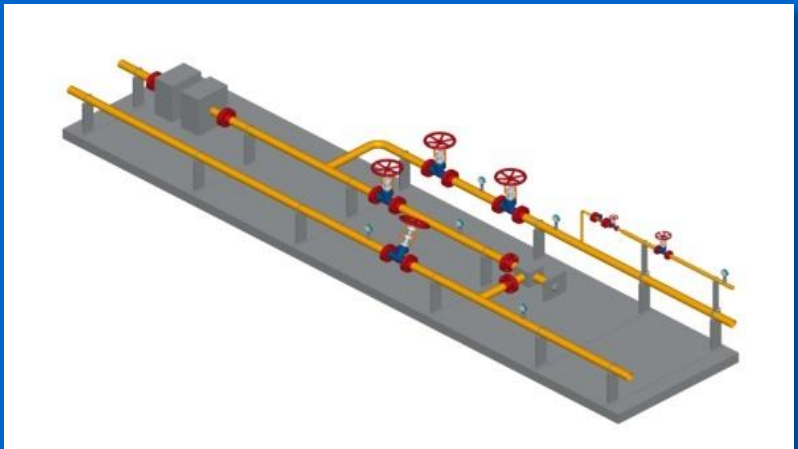
EQUIPMENT OF WELLS PIPING



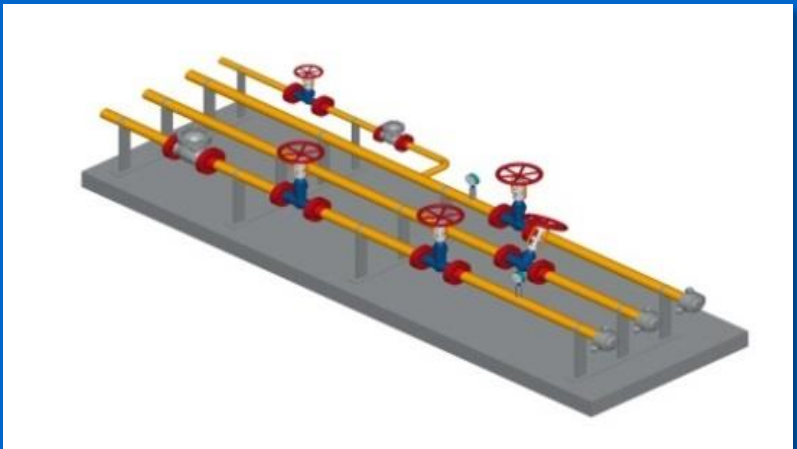
VALVE UNIT



CONNECTION UNIT OF INTERFIELD PIPELINE AND METHANOL PIPELINE

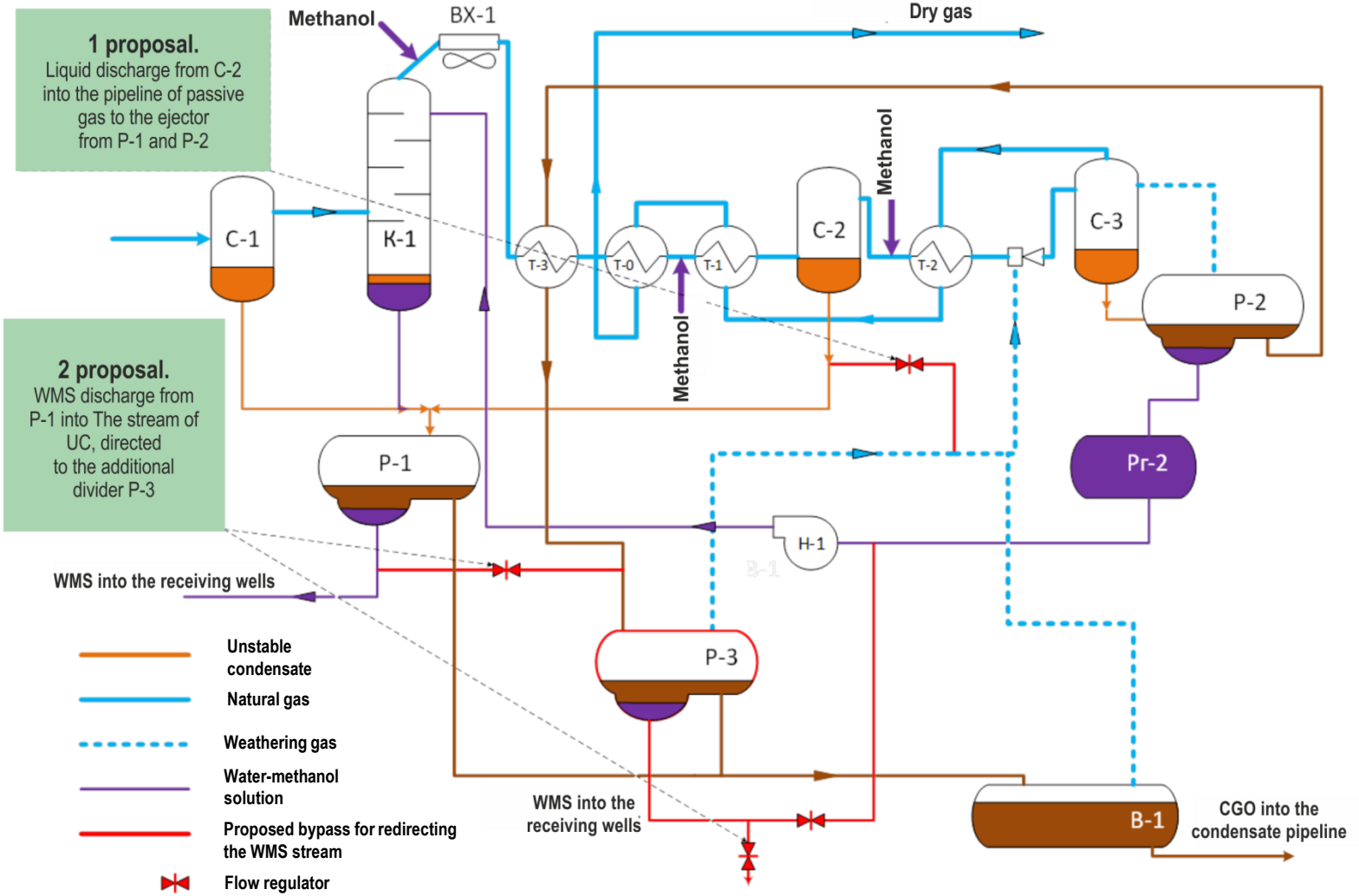


PIPING UNIT OF HORIZONTAL FLARE



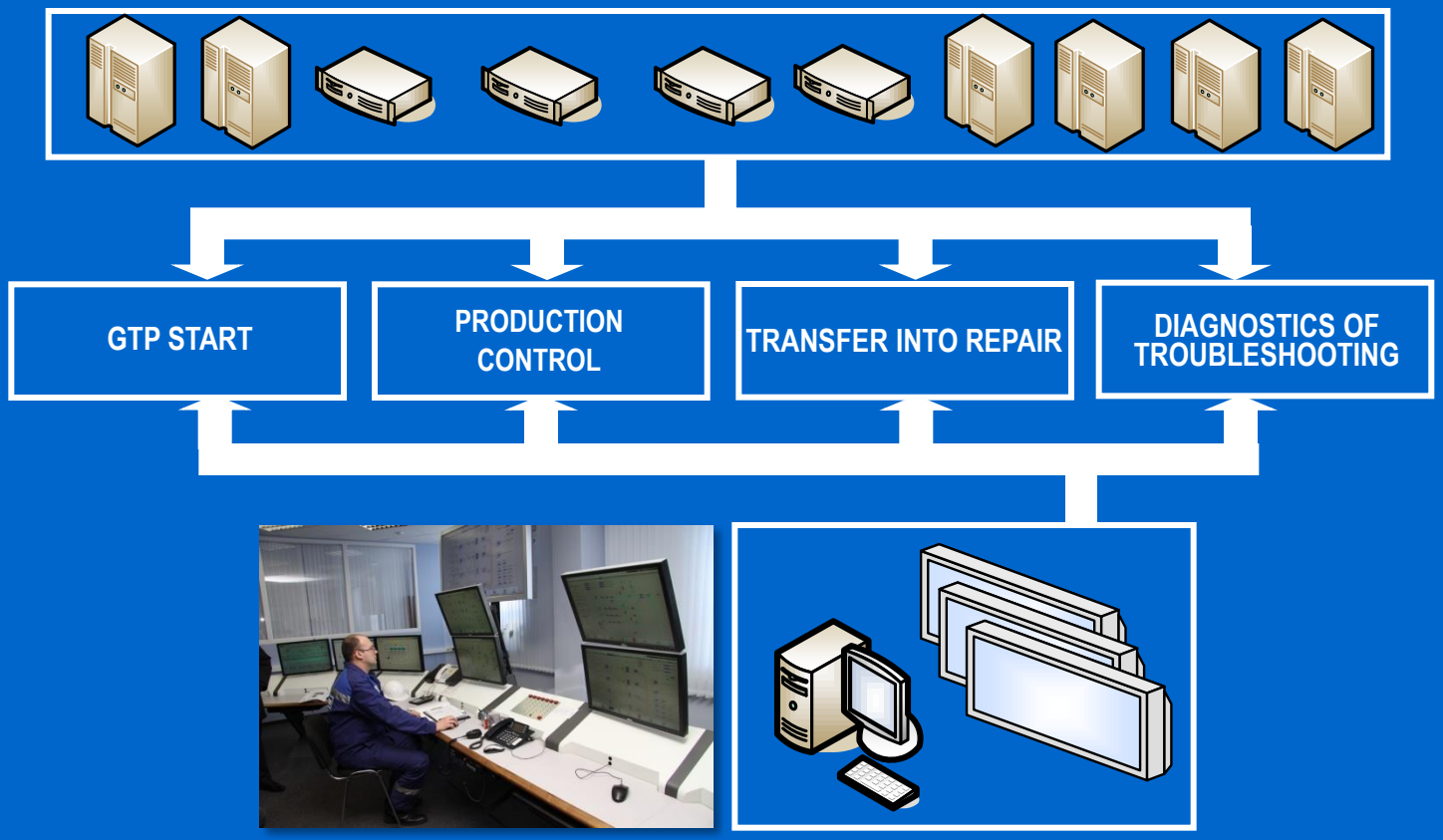
TEST SEPARATOR CONNECTION UNIT

IMPROVED SCHEME OF LOW-TEMPERATURE SEPARATION UNIT WITH METHANOL RECYCLING

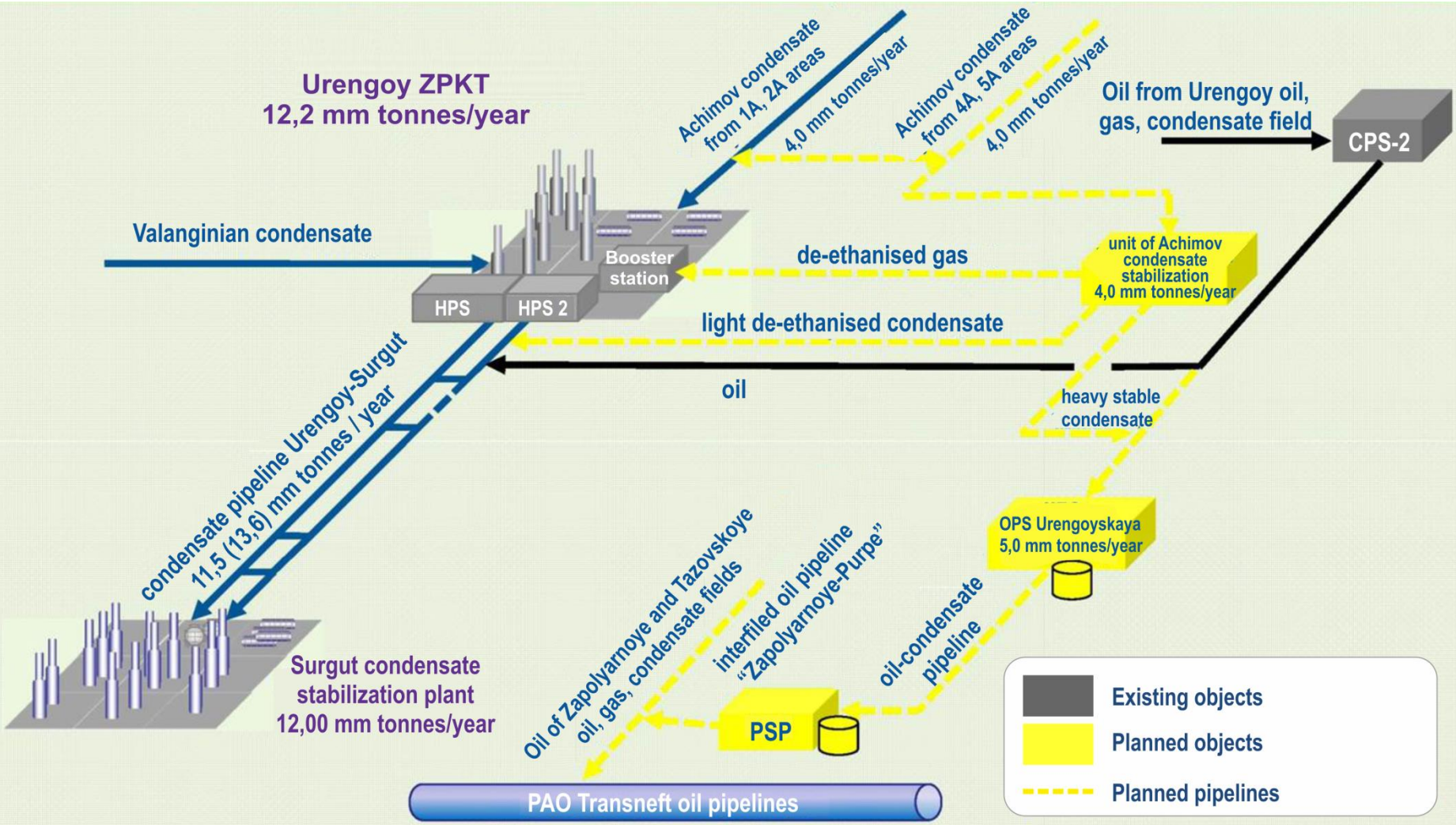


COMPLEX ALGORITHMS OF THE PROCESS CONTROL

INTERACTION OF LOCAL ALGORITHMS OF SINGLED UNITS OF GTP



PROSPECT FLOW PATTERN OF ACHIMOV CONDENSATE, GAZPROM DOBYCHA URENGOY LLC



ENVIRONMENTAL PROTECTION

SIMULTANEOUS INJECTION OF UTILITY AND INDUSTRIAL WASTEWATER

INDUSTRIAL AND ECOLOGICAL MONITORING

PITLESS DRILLING METHOD

STUDY OF WELLS WITHOUT GAS DISCHARGE INTO THE ATMOSPHERE

GAZPROM DOBYCHA URENGOY

THANK YOU FOR YOUR ATTENTION