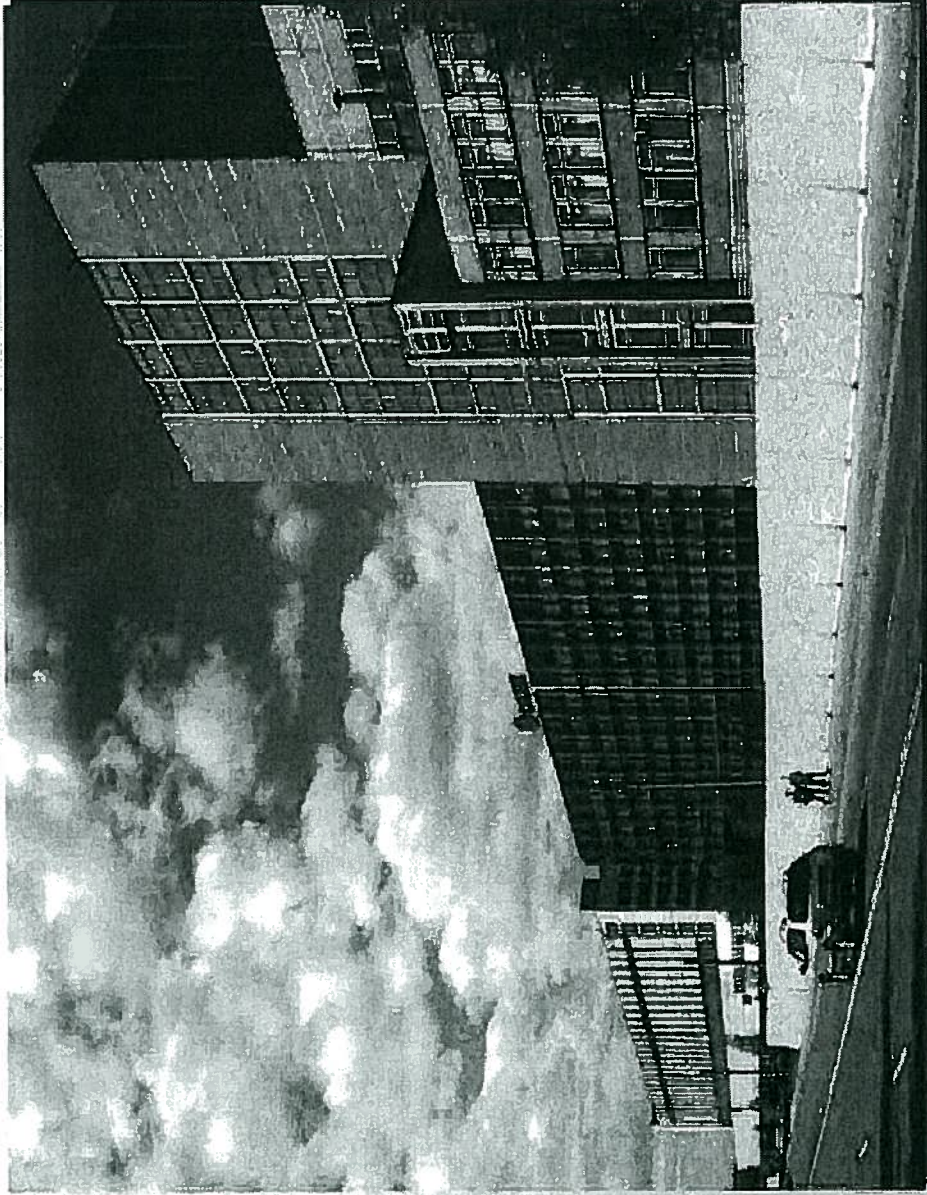


FSUE "I.I. AFRIKANTOV OKB MECHANICAL ENGINEERING"



**FOUNDED IN
1947**



**FEDERAL SCIENTIFIC AND INDUSTRIAL CENTER OF
NUCLEAR MACHINE BUILDING**



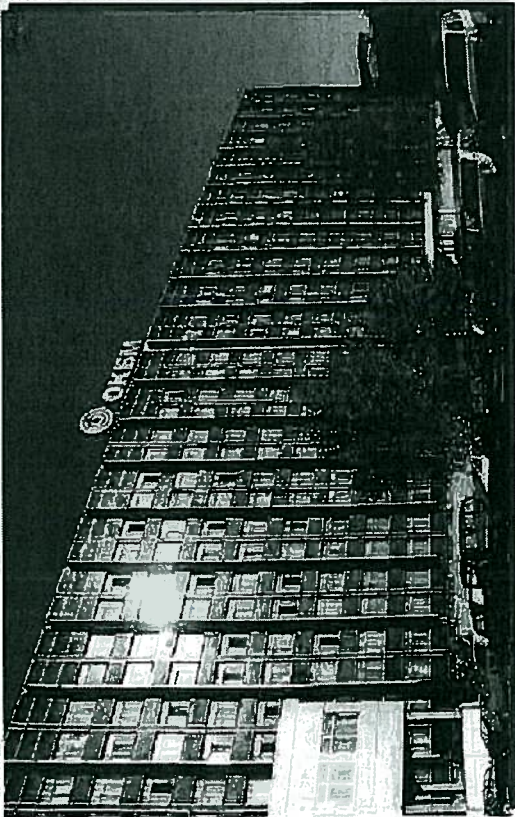
OKBM ORGANIZATIONAL STRUCTURE AND STAFF



- MANAGEMENT
- INDUSTRIAL AND PRODUCTION PERSONNEL
- DESIGN DIVISION
- RESEARCH AND TESTING COMPLEX

- DESIGN DIVISION – 1350
- TECHNOLOGICAL DIVISION – 180
- RESEARCH AND TESTING COMPLEX – 230
- INFORMATION TECHNOLOGIES DEPARTMENT – 80
- EXPERIMENTAL-INDUSTRIAL PRODUCTION FACILITIES – 580
- MANAGEMENT AND SUPPORT – 1000
- NON-INDUSTRIAL GROUP – 200

DESIGN DIVISION



● FUNCTIONS

- DEVELOPMENT AND MULTIVARIATE SEARCH OF OPTIMAL DESIGNS
- ANALYSIS AND VALIDATION OF DESIGN SOLUTIONS, CHARACTERISTICS AND OPERATING MODES
- IN-FIELD SUPERVISION OF FABRICATION, INSTALLATION AND OPERATION
- ANALYSIS AND SUMMARY OF EXPERIENCE GAINED FROM OPERATING PLANTS
- DISPOSAL OF OBJECTS

650 DESIGN ENGINEERS

SCIENTIFIC POTENTIAL:

OKBM SCIENTIFIC LEADER IS
F.M. MITENKOV, ACADEMICIAN OF THE
RUSSIAN ACADEMY OF SCIENCE

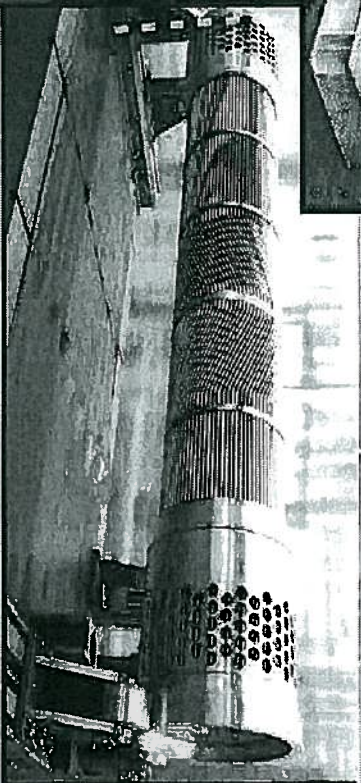
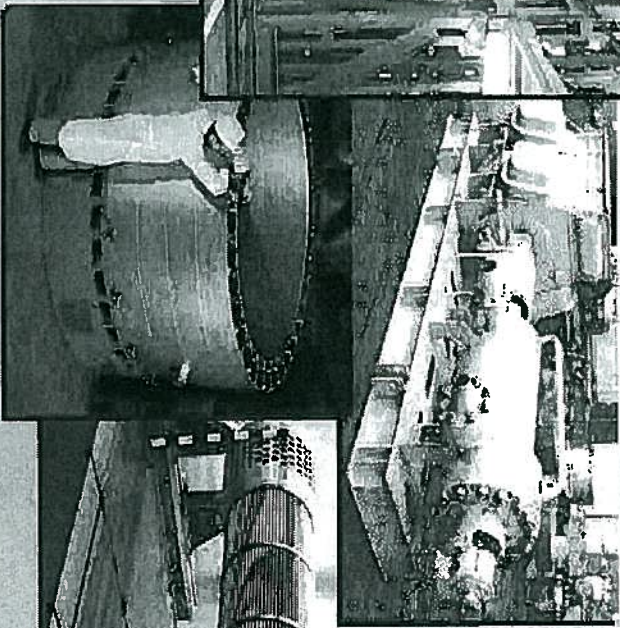
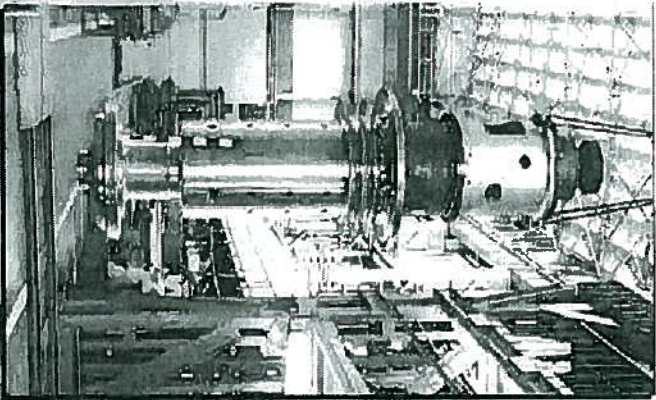
5 PROFESSORS

12 DOCTORS OF TECHNICAL SCIENCE

60 CANDIDATES OF TECHNICAL SCIENCE

EXPERIMENTAL-INDUSTRIAL PRODUCTION FACILITIES

- PRODUCTION AREA OF 16 440 m²
- MORE THAN 530 ITEMS OF PRODUCTION EQUIPMENT
- MOUNTING AND ASSEMBLY WORKSHOP FOR LARGE-SCALE EQUIPMENT
- MOUNTING AND ASSEMBLY WORKSHOP
- BLANK PRODUCTION SHOP
- DIVISIONS AND SECTORS



UP-TO-DATE PRODUCTION FACILITIES ENSURE FABRICATION OF EQUIPMENT PILOT SAMPLES AND TEST FACILITIES FOR THEM, SEPARATE TYPES OF EQUIPMENT FOR NUCLEAR POWER INDUSTRY AND NUCLEAR FLEET, AS WELL AS EXPORT-ORIENTED PRODUCTION

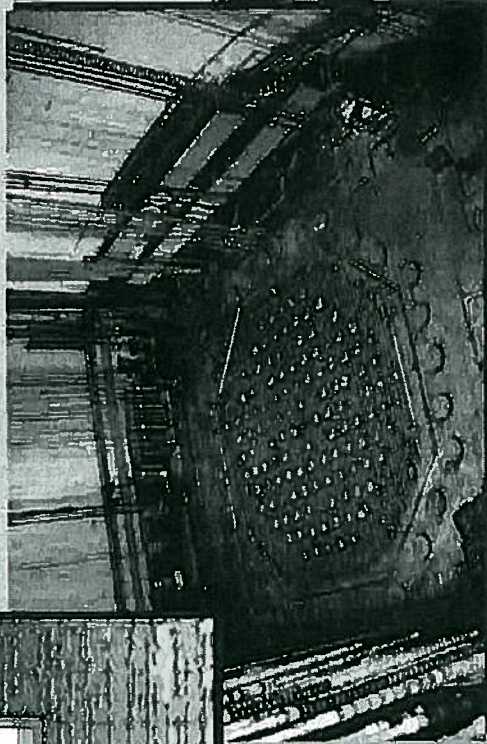
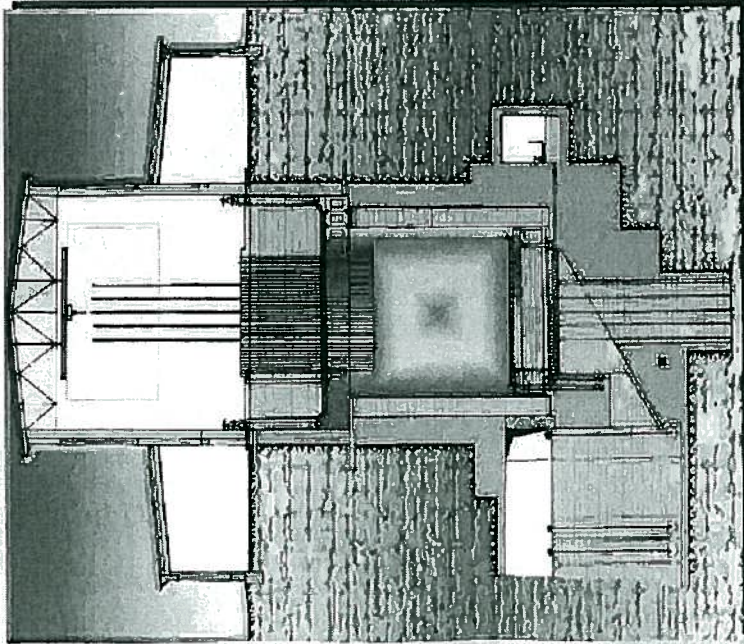
URANIUM-GRAPHITE AND HEAVY-WATER REACTORS

SINCE 1948

- URANIUM-GRAPHITE AND HEAVY-WATER REACTORS WERE CREATED FOR GENERATION OF WEAPONS-GRADE NUCLEAR MATERIALS

- 9 URANIUM-GRAPHITE REACTORS

- 7 HEAVY-WATER REACTORS

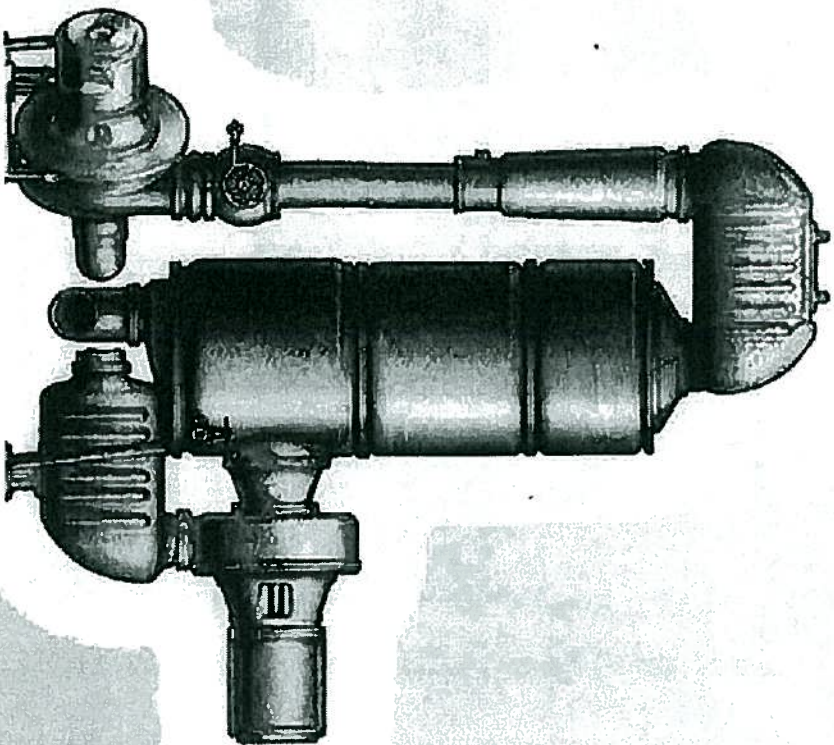


**OKBM CONTRIBUTION TO THE ESTABLISHMENT OF RUSSIAN NUCLEAR
POWER ENGINEERING AND NUCLEAR FLEET**

**GAS DIFFUSION MACHINES FOR
URANIUM ENRICHMENT**

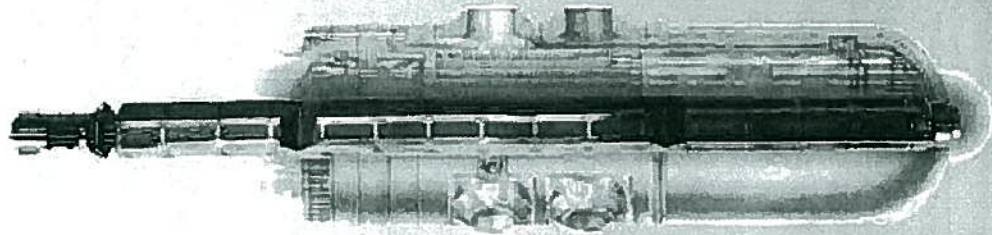
**IN 1947-1960, OKBM DEVELOPED AND TESTED
25 TYPES OF GAS DIFFUSION MACHINES,
FROM OK-6 TO OK-30M, OF INCREASING
POWER AND EFFICIENCY**

**THE STATE (STALIN) PRIZE
was awarded to 6 SPECIALISTS
THE LENIN PRIZE
was awarded to 5 SPECIALISTS
THE PRIZE OF THE COUNCIL OF MINISTERS
was awarded to 1 SPECIALIST**

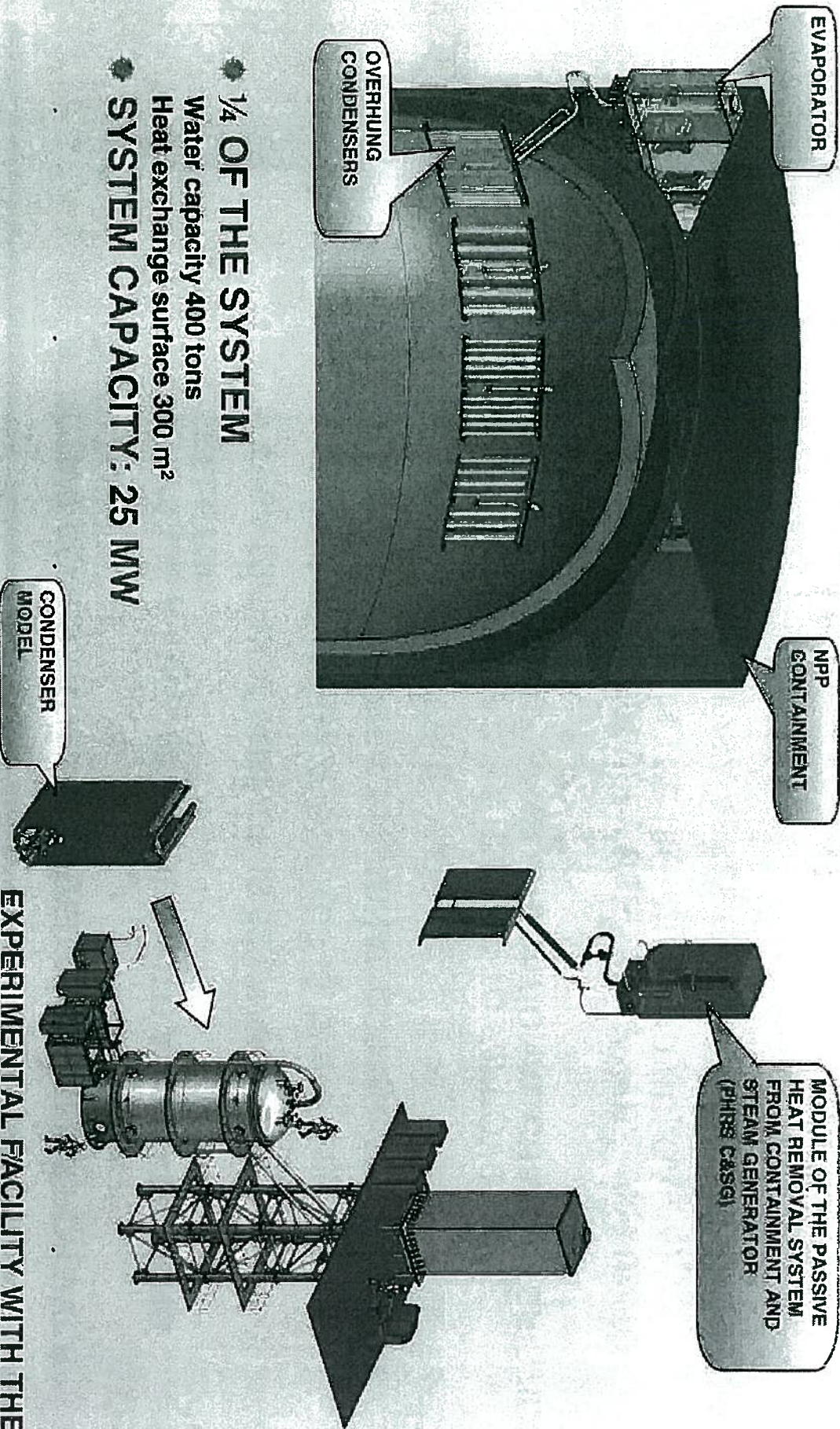


NUCLEAR FUEL

- ACTIVE CORES WITH TVSA FUEL ASSEMBLIES FOR VVER REACTORS
- TVSA IS A FUEL ASSEMBLY WITH A LOAD-BEARING SKELETON
- TVSA MINIMUM BURNUP IS 62 MW·day/kg U
- FUEL ROD MINIMUM BURNUP IS 72 MW·day/kg U
- OPERATING TIME AT NOMINAL POWER: 50000 eff. days
- OPERATION LIFE: 6 – 7 years
- INTRODUCTION OF TVSA HELPED TO IMPROVE THE TECHNICAL, ECONOMIC, AND OPERATIONAL CHARACTERISTICS OF VVER-1000 FUEL
- TVSA ARE SUCCESSFULLY USED AT 17 VVER-1000 UNITS (KALININ NPP, NPPs IN THE UKRAINE AND BULGARIA)
- MORE THAN 2000 TVSA ASSEMBLIES HAVE BEEN PRODUCED



DESIGN OF WATER PASSIVE HEAT REMOVAL SYSTEM FROM THE CONTAINMENT AND STEAM GENERATORS AES-2006

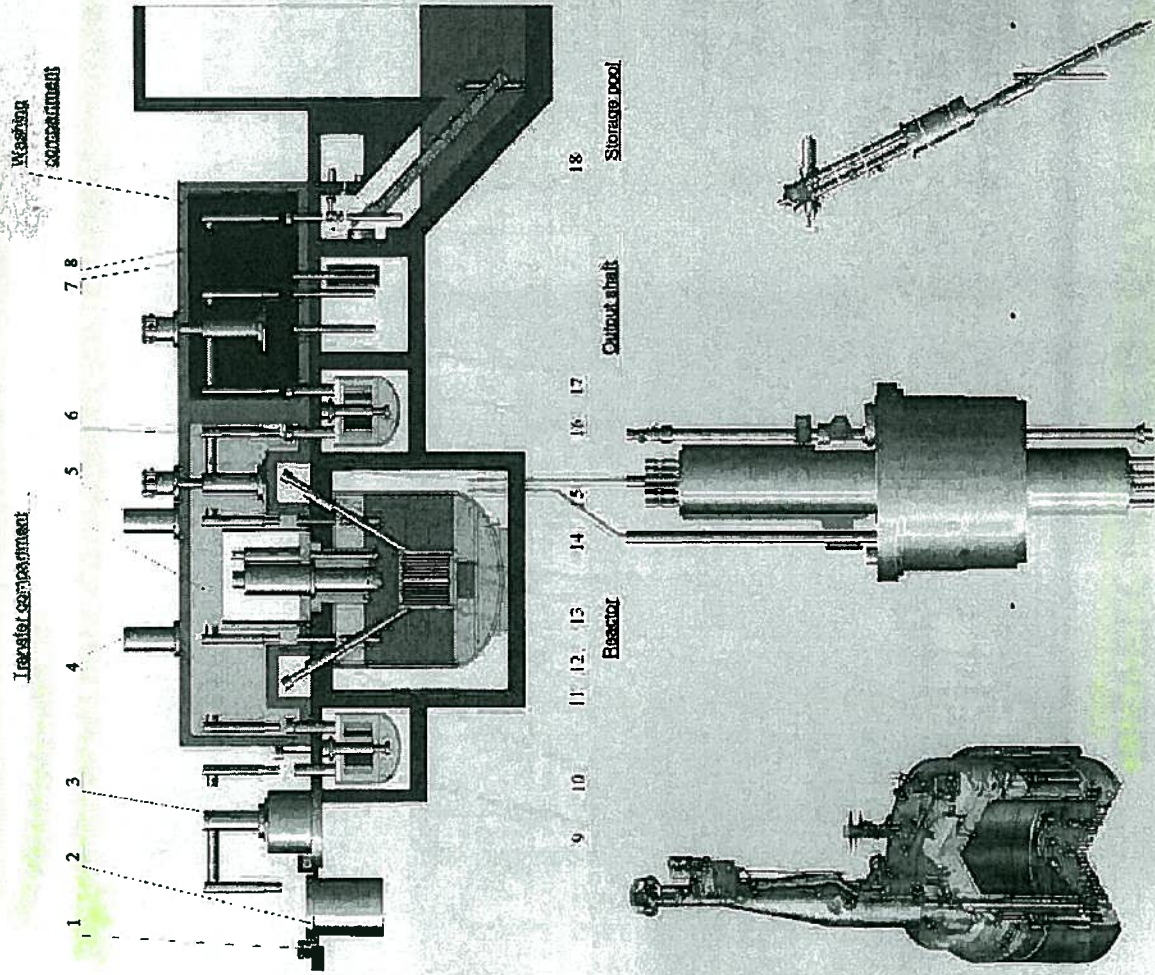


1/4 OF THE SYSTEM

- Water capacity 400 tons
- Heat exchange surface 300 m²
- SYSTEM CAPACITY: 25 MW

EXPERIMENTAL FACILITY WITH THE PHRS C&SG AES-2006

NUCLEAR FUEL HANDLING EQUIPMENT



● NPP REFUELING COMPLEXES FOR

- BOR-60
- BN-350, BN-600
- CEFR (CHINA)

● RELOADING AND DISPOSAL OF REACTOR CORES OF NUCLEAR SUBMARINES

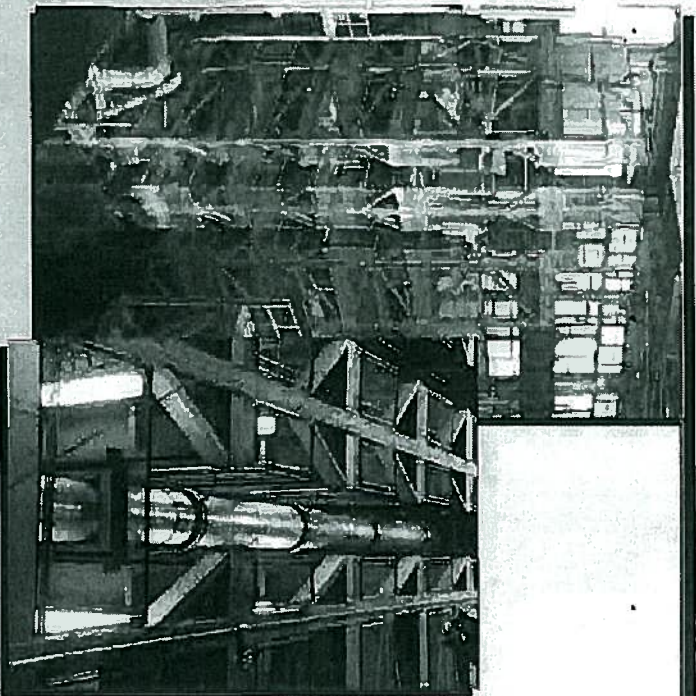
● CPS RODS AND DRIVE MECHANISMS

● FUEL HANDLING EQUIPMENT AND MECHANISMS FOR

- AST-500
- GT-MHR
- VBER-300

● EQUIPMENT FOR DRY SPENT FUEL STORAGES

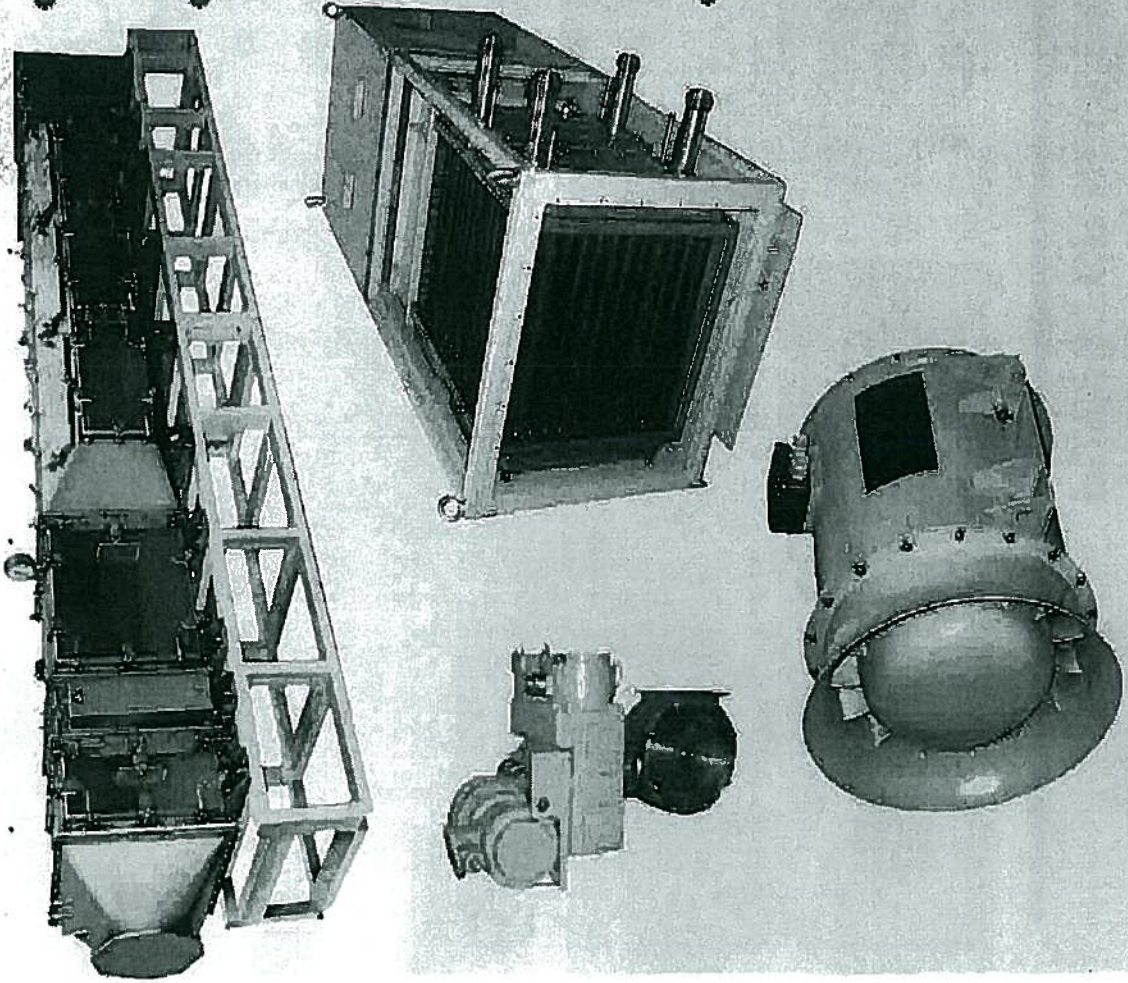
DEVELOPMENT OF STANDARD EQUIPMENT FOR NPPs



- STANDARD VENTILATION EQUIPMENT FOR VVER-1000 NPPs
- STANDARD PUMP EQUIPMENT FOR VVER-1000 AND VVER-1500 NPPs
- TEST COMPLEX FOR FULL-SCALE TESTS OF PUMPS

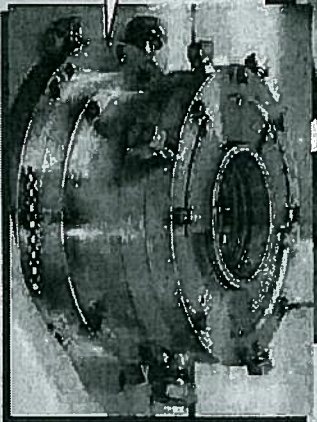
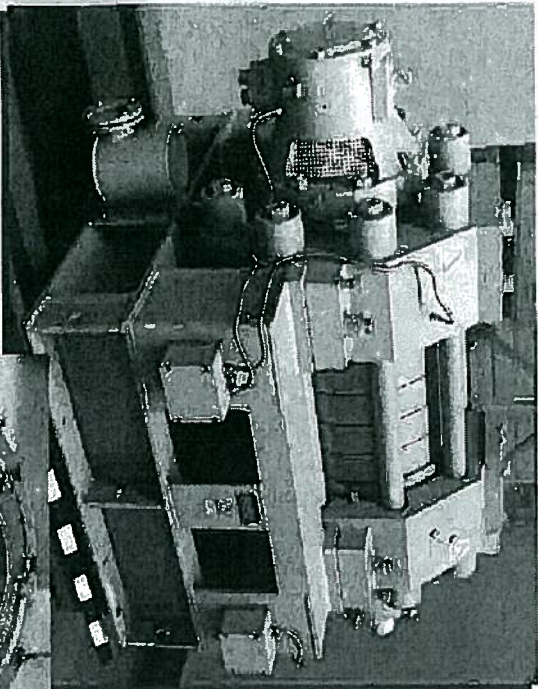
- 152 PUMPS OF 11 STANDARD SIZES FOR TIANWAN NPP WERE DEVELOPED, FABRICATED, AND SUPPLIED
- EQUIPMENT FOR CEFR REACTOR (CHINA) WAS DEVELOPED, FABRICATED, AND SUPPLIED
- INTEGRATION OF PLANT-SHARED EQUIPMENT AT "BUSHEHR" NPP IS IN PROGRESS
 - 318 PUMPS (96 STANDARD SIZES)
 - 232 VENTILATION PLANTS AND FANS (89 STANDARD SIZES)

VENTILATION EQUIPMENT FOR NUCLEAR POWER PLANTS



- "LIST OF STANDARD EQUIPMENT FOR NUCLEAR POWER PLANTS" HAS BEEN DEVELOPED AND APPROVED
- MORE THAN 40 DESIGNS FOR VARIOUS TYPES OF EQUIPMENT WERE DEVELOPED
 - RECIRCULATION COOLING PLANTS
 - AXIAL FANS
 - WATER-COOLED AIR COOLERS
 - VENTILATION DUCT SHUTOFF DEVICES
 - COMBINED FILTERING PLANTS
 - PRESSURIZED ISOLATION AND SHUT-OFF VALVES
- THE FULL SPECTRUM OF VENTILATION EQUIPMENT FOR THE CONTAINMENT, AND PART OF EQUIPMENT FOR THE NPP REACTOR BUILDING WAS DEVELOPED

PUMPS FOR NUCLEAR POWER PLANTS



SEAL ASSEMBLY

- OKBM FABRICATES AND SUPPLIES MAIN CIRCULATING PUMPS AND PLANT-SHARED SYSTEM PUMPS HAVING THE FOLLOWING CHARACTERISTICS

OPERATION WITH WATER

- HEAD to 750 m
- CAPACITY to 8000 m³/hr
- POWER to 5600 kW

OPERATION WITH SODIUM

- HEAD to 120 m
- CAPACITY to 9700 m³/hr
- POWER to 3400 kW

- CONFIRMED LIFETIME AMOUNTS TO 30 – 130 THOUSAND HOURS
- ASSIGNED SERVICE LIFE EQUALS TO 30 YEARS

FSUE "I.I. AFRIKANTOV OKB MECHANICAL ENGINEERING"

Russia, 603074, Nizhny Novgorod,
Burnakovsky proyezd, 15

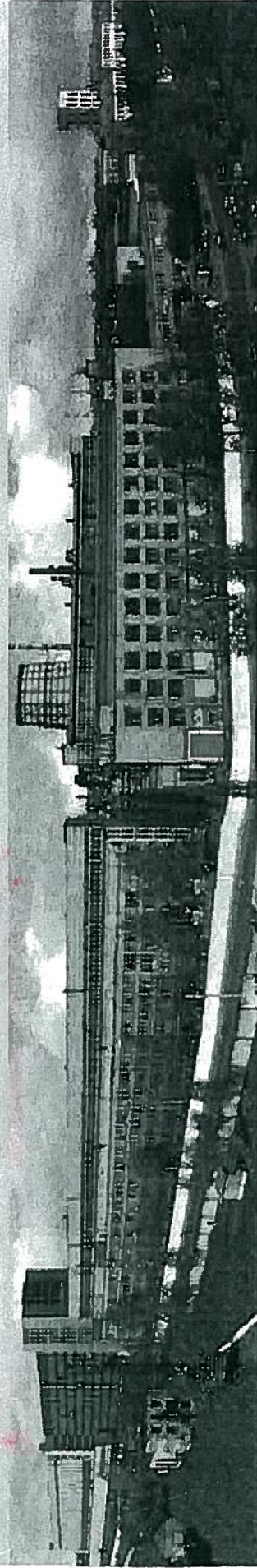
Phone (8312) 75 40 76,

75 26 40

Fax (8312) 41 87 72

E-mail: okbm@okbm.nnov.ru

www.okbm.nnov.ru



INTERNATIONAL COOPERATION

- ◆ SINCE 1958, OKBM HAS BEEN PARTICIPATING IN INTERNATIONAL COOPERATION:
 - ◆ THE INTERNATIONAL GT-MHR PROJECT (GENERAL ATOMICS, WESTINGHOUSE (USA) etc.)
 - ◆ **"BUSHEHR" NPP IN IRAN**
 - ◆ CEFR EXPERIMENTAL FAST REACTOR IN CHINA
 - ◆ "KUDANKULAM" NPP IN INDIA
 - ◆ IAEA TECHNICAL MEETINGS, INTERNATIONAL EXHIBITIONS, CONFERENCES, AND SEMINARS ON NUCLEAR POWER

