



ENGINEERING CENTRE OF FIRE ROBOTS TECHNOLOGY "FR" LLC

COMPANY OVERVIEW



Engineering centre of fire robots technology “FR” LLC is an innovative company and holds a leading position in the development and production of firefighting robots, fire monitors and handline nozzles in Russia and the CIS.

The main areas of activity



Development and production of fire-fighting products and their components.



Execution of works on designing of fire protection systems for buildings and structures with the use of firefighting technology and firefighting robots.



Installation, commissioning, repair and maintenance of fire suppression systems.



Creation and implementation of new samples of equipment and technologies for objects' fire protection.



Production of parts and assembly units for various industrial purposes and the manufacture of metal products and metal structures.



HISTORY OF CREATION



1984

The Engineering centre “FR” traces its lineage since **1984**, when the first firefighting robot which was developed by engineers from Karelia was applied for the protection of the monument of wooden architecture of Kizhi Museum



1985

A Laboratory of firefighting robots was created in **1985** in Petrozavodsk with a state support



1986

Firefighting robots were also involved in the liquidation of Chernobyl disaster in **1986**

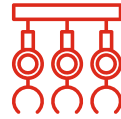


HISTORY OF CREATION



1987

In 1987, a firefighting robot was awarded the VDNH gold medal



1989

By order of the Ministry of Atomic Energy a robotic fire suppression system was developed and applied to protect the machine room of the Leningrad NPP in 1989



1993

In 1993 the Laboratory of firefighting robots was transformed into the Engineering centre of fire robots technology "FR"

ТЕЛЕГРАММА
МИНИСТРА ВНУТРЕННИХ ДЕЛ СССР
ПЕТРОЗАВОДСК МВД КАССР
МЯУКИНУ

Прошу Вас срочно организовать отгрузку гидромонитора с комплектующим оборудованием, средствами управления, смонтированным в музее "Кижы". Адрес: Москва ст. Бескудниково. Получатель п/я Р6476. Договориться с руководством Онежского тракторного завода в направлении специалистов разработчиков установки.

Об исполнении доложите.

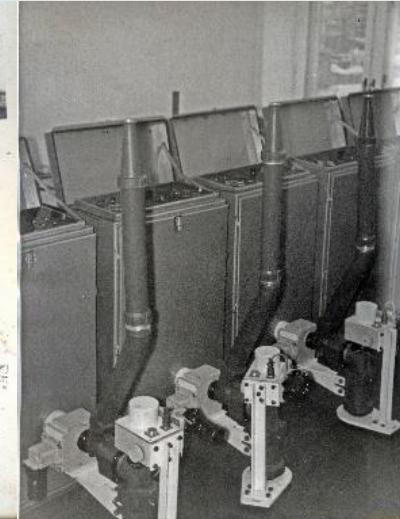
Власов
02.06.86

ТЕЛЕГРАММА
МИНИСТРУ ВНУТРЕННИХ ДЕЛ
генерал-лейтенанту Власову А.В.

МВД КАССР сообщает, что гидромонитор, комплектующее оборудование и средства управления на автомобиле в I-30 минут 04.06.86 направлены по указанному адресу.

Авторы-разработчики гидромонитора в составе 3-х человек 04.06.86 в I4-00 самолётом вылетели в Москву.

Генерал-майор
В.Г.Мяукин



ENGINEERING CENTRE "FR" TODAY



Modern production facilities at the Plant of firefighting robots and firefighting equipment



Development and production of innovative and high-tech firefighting products



The company supplies its products throughout Russia and near and far abroad (Ukraine, Kazakhstan, Belarus, China, Bulgaria)



Over **35 years** of working experience in the firefighting technologies market



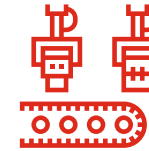
CURRENTLY THE ENGINEERING CENTRE OF FIRE ROBOTS TECHNOLOGY "FR" INCLUDES:



**Design
bureau**



**Department of electrical
hardware and software
development**



**Firefighting robots and fire
monitors factory incorporating
testing ground
and pilot production section**



**Project
department**



**Service department
(installation supervision,
commissioning, etc.)**



Production and marketing management is carried out by qualified specialists using a digital production management system.

TECHNOLOGICAL CAPABILITIES

01

Production is carried out at its own production site of 5000 sq.m.

02

The company has a modern fleet of high-performance CNC machining centers and well-adjusted serial production technology.

03

The company employs highly qualified personnel of engineering, technical and production workers.

In 2018, the Engineering centre "FR" was declared the best production facility of the Republic of Karelia.



R&D ACTIVITIES

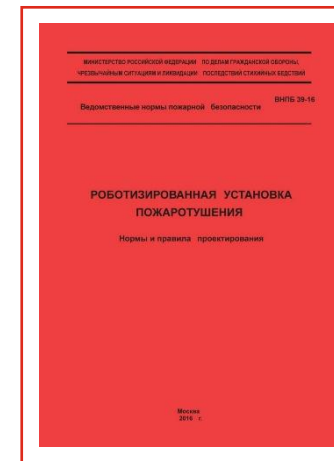
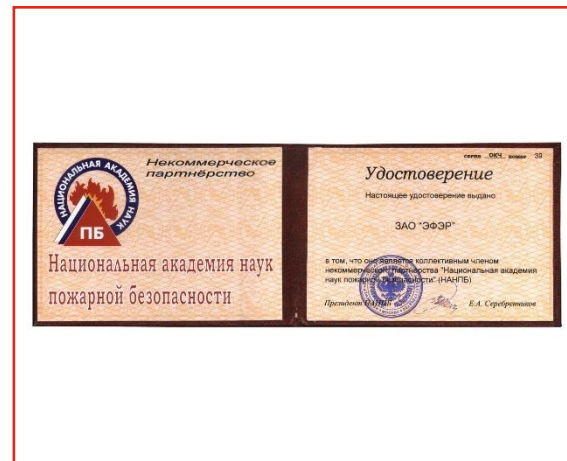


One of the areas of work of Engineering Center FR LLC is scientific activity. With the participation of our experts developed:

- Technical specifications for robotic fire suppression system TU 4854-005-16820082-2005.
- Technical specifications for fire monitors TU 4854-003-16820082-2008.
- VNPB 39-20. Robotic fire suppression systems. Design rules and regulations. Company-specific standard STO-CTU 1682.0017-2020.

Engineering centre "FR" LLC participated in the preparation of proposals for the following regulatory documents:

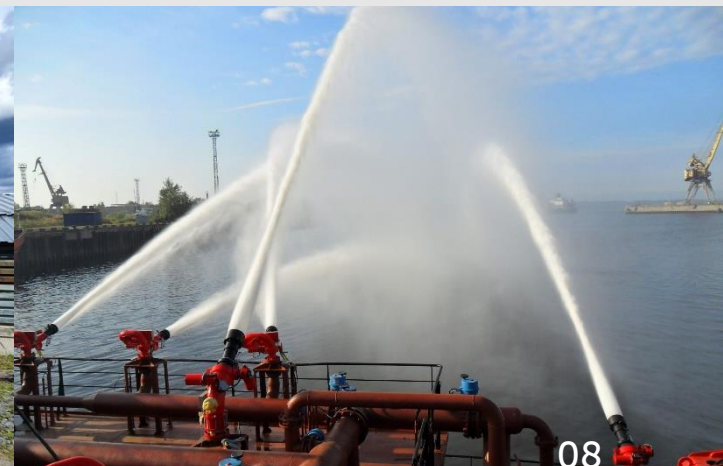
- GOST R 51115-97 Fire equipment. Fire turntable monitors. General technical requirements. Test methods.
- GOST R 53326-2009 Fire equipment. Self-contained open-circuit compressed air breathing apparatus. General technical requirements. Test methods.



The company develops and conducts promising and relevant R&D. Among them are:

- R&D work on firefighting equipment for forest fire tractor (commissioned by the Ministry of Economic Development of the Republic of Karelia).
- R&D work "Development of a stationary robotic fire suppression system for fire protection of large concert halls, shopping malls, aircraft hangars, turbine rooms and other large facilities" (joint work with the FBGU VNIPO of EMERCOM of Russia commissioned by the Science and Technology department (NTU) of EMERCOM of Russia).
- Joint work with the Solombala machine-building plant for the creation of a fire-fighting barge KSP PNS with a pumping station and water jet cannon.
- R&D work "Robotic fire suppression system for the protection of sports facilities based on firefighting robots in a vandal-proof modification."
- R&D "Development of a multifunctional complex for fire protection of nuclear power plant engine rooms" by order of Rosenergoatom Concern JSC.

The leading experts of Engineering centre FR were awarded the Government Prize of the Russian Federation in the field of science and technology for the development, production and widespread implementation of intelligent automatic fire suppression systems in 2020.



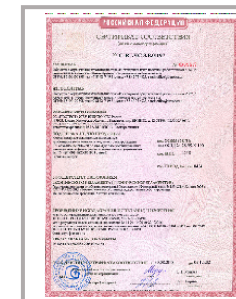
CERTIFICATES. PATENTS



The output products are certified to the fire safety standards system and comply with the requirements of the Register of Shipping and Rostekhnadzor on the conditions of the application objects.

The novelty of technical solutions is confirmed by patents. As of 2021, the Engineering centre "FR" LLC holds 27 valid patents of the Russian Federation and two international patents for its products.

The quality management system of Engineering Center FR is certified for compliance with ISO 9001: 2015 and STO Gazprom 9001:2018.



AWARDS



Engineering centre "FR" actively participates in Russian and International exhibitions, research and practice conferences, and seminars. "FR" products were awarded the VDNH gold medal (1987), and repeatedly became laureates and winners of specialized exhibition events.



PRODUCTS



Engineering centre “FR” has developed, certified and serially produces the entire range of firefighting equipment and its components:



01

Fire monitors
as per GOST 51115-97



03

Firefighting robots
as per GOST R 53326-2009



05

Robotic fire suppression systems
– (VNPB 39-20)



02

Handline nozzles of RSKU series
as per GOST R 53331-2009



04

Firefighting mini robots
as per GOST R 53326-2009



06

Fire towers

FIRE MONITORS

- fixed, portable and trailer-mounted modifications
- productivity – from 15 to 330 l/s
- manual and remote control
- in general industrial, marine and explosion-proof versions

Application: are widely used in integrated fire protection systems and as mobile firefighting equipment



Fire monitors with oscillators



Fire monitors portable



Fire monitors in explosion-proof version



Fire monitors with ball socket with remote control



Fire monitors trailer-mounted

On fire boats



On fire trucks



Protection of industrial objects



HANDLINE NOZZLES

- combined universal
- with wide range of flow rates from 2 to 8 l/s and from 6 to 15 l/s
- With manual and automatic adjustment of water or foam flow rate

Handline nozzles are used to equip fire trucks and motor pumps, and can also be installed in fire cabinets to protect various objects.



Handline nozzle with flow rate 6-15 l/s



Handline nozzle with flow rate 4 l/s



Handline nozzle with ejector



Handline nozzle automatic «FLUSH»



Handline nozzle water mist



FIREFIGHTING ROBOTS AND ROBOTIC FIRE SUPPRESSION SYSTEMS



- automatic determination of the source of ignition in 3D system
- automatic extinguishing
- targeted extinguishing agent supply
- flexible control system, self-testing

Effective protection of high-span structures and outdoor fire hazardous facilities



Firefighting robot with IR-scanner



Firefighting robot with ball-socket



Firefighting mini robot



Firefighting robot in the vandal-proof modification



Firefighting robot in the explosion-proof modification

Hazardous facilities



Aircraft and helicopter hangars



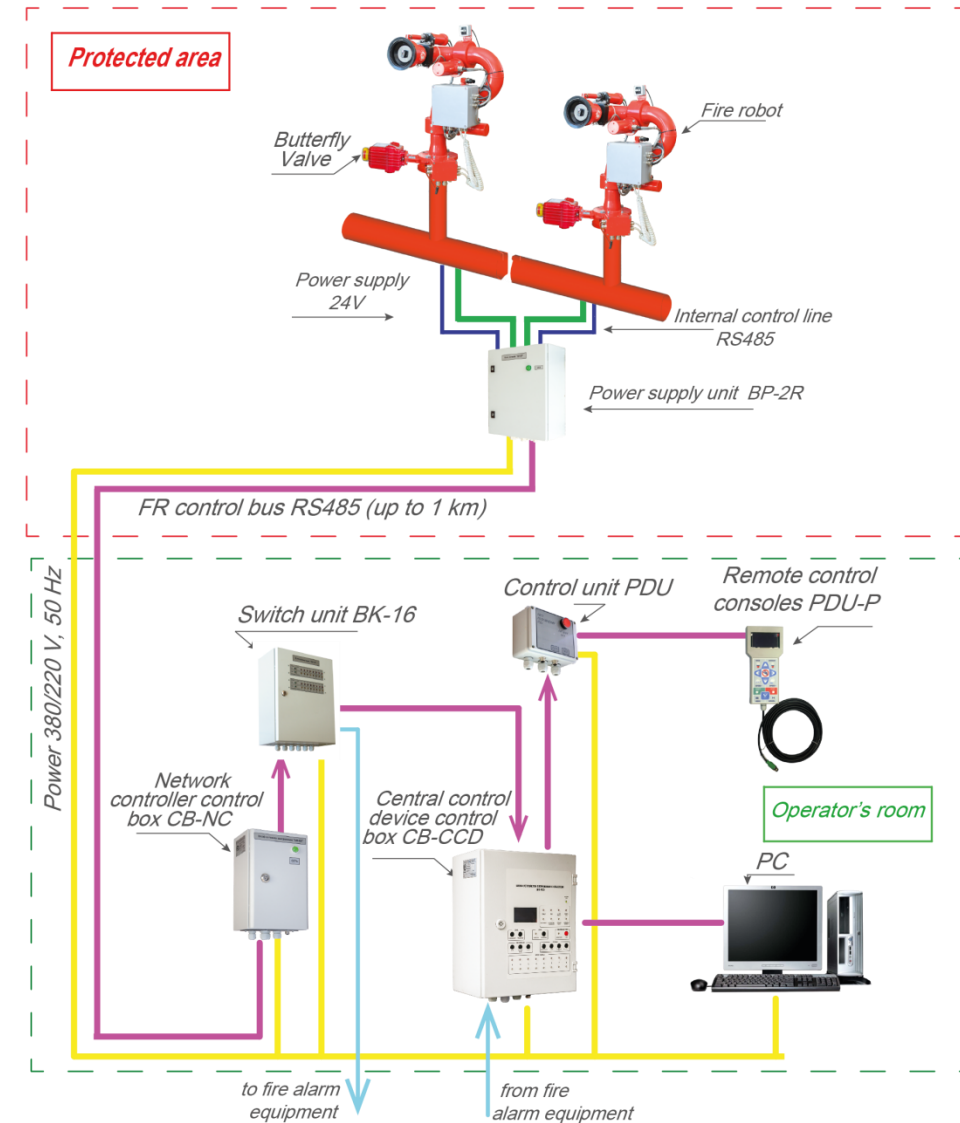
Sports and exhibitions complexes



ROBOTIC FIRE SUPPRESSION SYSTEMS (RFSS)

Innovative and effective technology of protection and fire extinguishing in the objects where other technologies are not applicable.

- Robotic fire suppression systems are formed from firefighting robots connected by a common control system.
- Provide a complete cycle of fire extinguishing in automatic and remote modes, system self-test in standby mode.
- Development of special technical conditions is not required (VNPB 39-20 "Robotic fire extinguishing installation. Norms and design rules. Special technical conditions)



APPLICATION AREA



Fire protection of high-span structures and outdoor fire hazardous facilities, like the following:

- aircraft hangars
- turbine rooms of CHPs and NPPs
- sports and exhibitions complexes
- tunnels
- warehouses for different products
- tank farms
- oil loading racks
- gas-condensate separators
- oil terminals, marine terminals and offshore oil rigs
- helicopter sites
- monuments of wooden architecture



ROBOTIC FIRE SUPPRESSION SYSTEM WITH FIREFIGHTING MINI ROBOTS



Innovative and effective protection of industrial and public buildings and structures.

Firefighting mini robots:

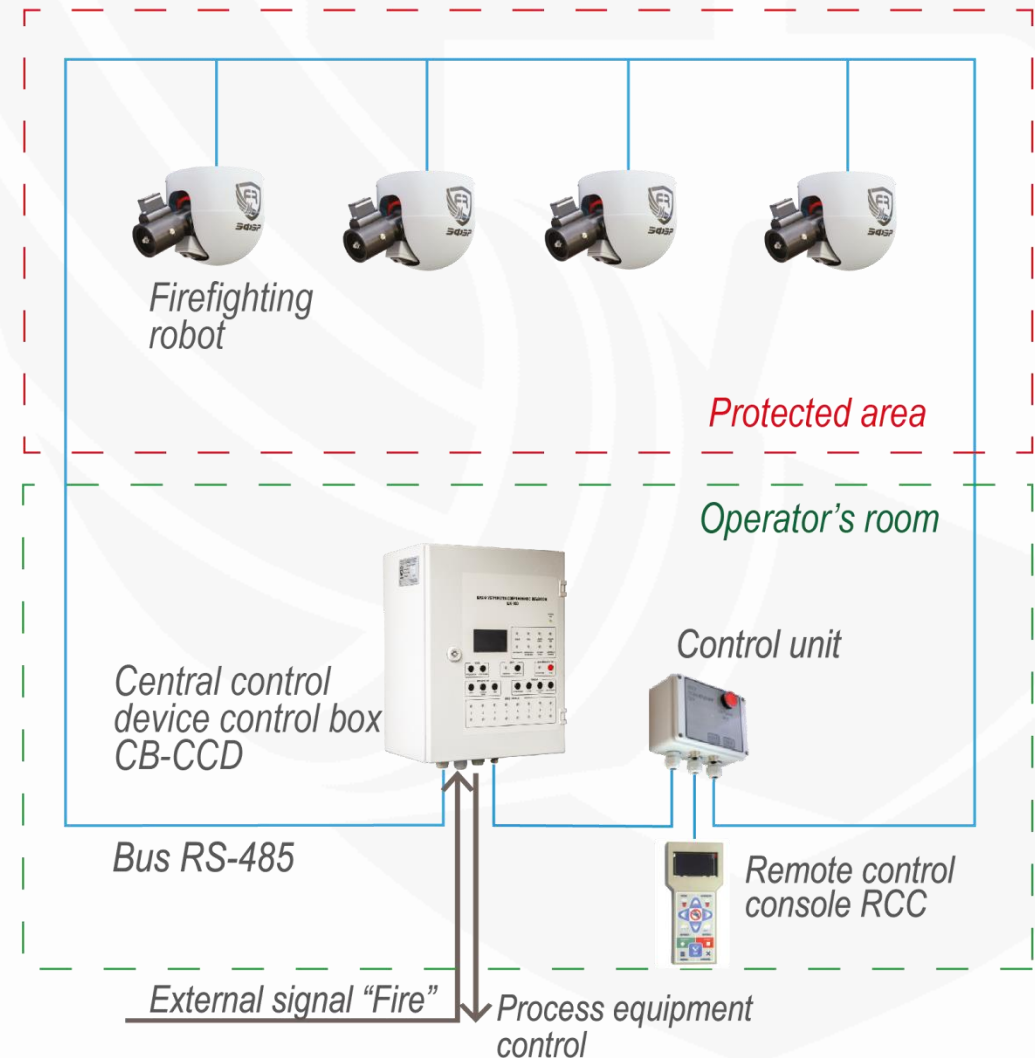
- production capacity - 4, 10, 15, 20 l/s,
- fire extinguishing with dispersed water and water mist

Features

- automatic fire detection and automatic fire extinguishing
- targeted extinguishing of fire by the entire flow rate of the extinguishing agent
- remote monitoring of the readiness

Advantages

- reduction of damage
- significant protected area
- ease of installation
- cost effectiveness



APPLICATION AREA OF RFSS WITH MINI ROBOTS



- shopping, exhibition, sports complexes, administrative buildings, museums, book depositories, libraries, hotels, hospitals, etc. (fire water extinguishing);
- production and storage facilities (woodworking, textile, knitting, printing, etc.), car parks (extinguishing with foam solution).

Firefighting mini robots with dispersed water are effective for protecting structures and objects where it is necessary to minimize the amount of water supplied during extinguishing a fire due to lack of water or the inadmissibility of excessive amounts of liquid entering objects, for example, museums, libraries.



FIREFIGHTING ROBOTS FOR PROTECTION AIRCRAFT AND HELICOPTER HANGARS



- **Yuri Gagarin International Airport, Orenburg**
Aircraft Maintenance Hangar

- **Airport Sheremetyevo-1, Moscow**
Hangar No.2 and aircraft service station:
RFSS with 8 FR-LSD-S20U-IR-TV, area -
5300 sq.m.

- **Vnukovo International Airport**
aircraft fleet of the President of
Russia: RFSS with 17 firefighting
robots. area – 11000 sq.m

FIREFIGHTING ROBOTS FOR PROTECTION INDUSTRIAL OBJECTS



- **Transformer factory LCC "Silovie machini" - TOSHIBA. Visokovoltne transformatori"**
Saint-Petersburg

- **JSC Obukhov State Plant**
production halls, St. Petersburg , RFSS with 25
firefighting robots FR-LSD-S40U-IR

FIREFIGHTING ROBOTS FOR PROTECTION SPORTS AND EXHIBITION COMPLEXES



Universal sports complex in the territory of the Academy
of EMERCOM of Russia

Novogorsk, RFSS with 6 FR-LSD-S40U-IR, area– 7000 sq.m.



Gazprom Arena Stadium
St. Petersburg

PROTECTION OF HAZARDOUS FACILITIES AND CONSTRUCTIONS



Vostochny Cosmodrome, objects:

- launch complex
- spacecraft assembly and test building
- launch vehicle assembly and test building
- Soyuz-2 launch vehicle start complex, site 1C

Plesetsk Cosmodrome, object:

testing complex

Customer:

Federal State Unitary Enterprise "Special Design Bureau of Fire fighting Equipment"

PROTECTION OF THE OBJECTS OIL AND GAS INDUSTRY



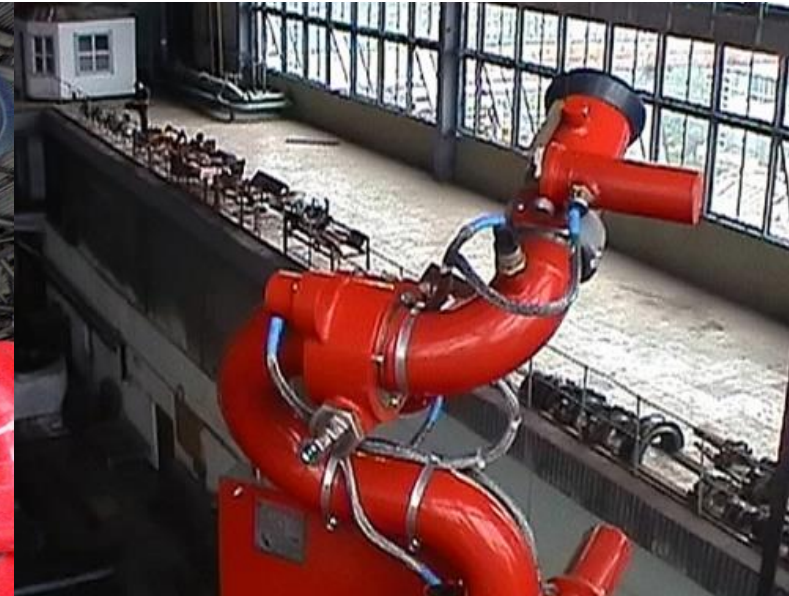
LCC «Transoil-Terminal»

in Norimanov City, Astrahan region Loading and unloading railway platform for liquefied hydrocarbon gas.

The oil tank farm of the plant Udarnik .

Railway loading and unloading platform for light oil products and fire fighting pumping station.

FIRE PROTECTION OF POWER FACILITIES (CHPS, NPPS, AND HPPS)



- **Petrozavodsk CHP, Petrozavodsk.**

Robotic fire suppression system for cooling steel structures of the turbine room .

- **Kurakhovskaya TPP, Donetsk region.**

Protection 7 power units of a thermal power plant. 14 firefighting robots FR and 6 FR-LSD-S40U.

- **Lugansk TPP, Donetsk region**

Firefighting robots FR-LSD-S40U (16 pcs.) for protection of 6 power units

- **Surgut HPP , turbine room .**

Water cooling, robots quantity - 6 FR-LSD-S60(20)U-Ex

ENGINEERING CENTRE OF FIRE ROBOTS TECHNOLOGY FR LLC

Member of SRO NP "Interregional Building Union of Designers of Fire Protection Systems" and has a certificate of admission to the works connecting with preparation of projects to ensure fire safe.

A collective member of the National Academy of Fire Safety Sciences (NANPB), since 2012, has been a member of the methodological council for technical regulation in the field of fire safety at the NANPB.

The quality management system is certified for compliance with international standards ISO 9001.

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