

GLOBAL INITIATIVES FOR PROLIFERATION PREVENTION EXAMPLES OF SUCCESS

National Security – Counter-Terrorism – Global Peace

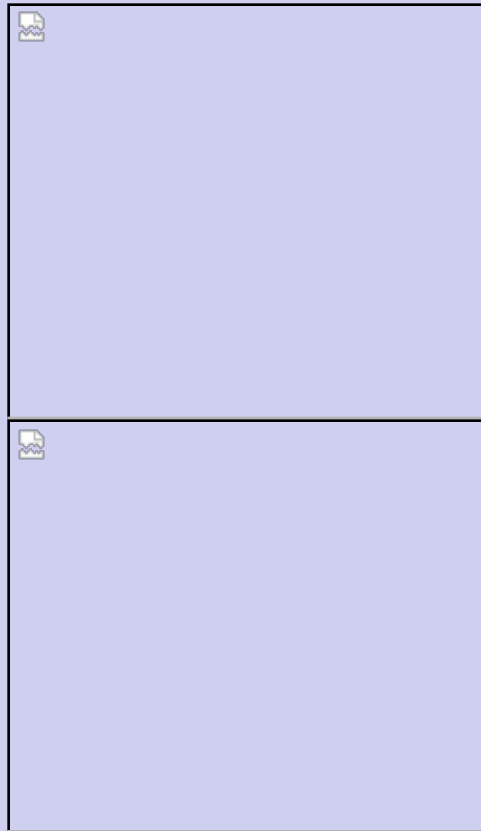
The Global Initiatives for Proliferation Prevention (Global IPP)

program, sponsored by the National Nuclear Security Administration (NNSA) at the U.S. Department of Energy (DOE), helps prevent proliferation of WMD expertise to terrorists or states of concern by creating sustainable, non-weapons work for former weapons scientists, engineers, and technicians in Russia and the former Soviet Union (FSU).

Global IPP projects support technology commercialization partnerships between former Soviet weapons institutes, DOE national laboratories, and U.S. companies. The U.S. companies are required to match project funding with their own resources, thus leveraging federal dollars. For its part, the program serves as matchmaker, bringing the partners together and supporting the work of former Soviet scientists, as well as the technology validation services of DOE laboratories to reduce the technical risk faced by U.S. industry partners. When a project is successful, the U.S. company continues to finance product development through its own resources, and together with its FSU partner, takes the product to market.

In recent years, Global IPP has created over 2,300 sustainable private sector jobs for former Soviet weapons scientists in Russia and the FSU, and engaged thousands more in promising applied R&D projects with U.S. industry. Moreover, FSU partners recently have launched 14 new independent businesses, and Global IPP projects have resulted in creation of hundreds of jobs in the United States as well.

The program's success is evident in the steadily growing annual revenues of U.S. companies and their FSU partners, which routinely surpass the Global IPP budget. Outside financing raised by U.S. companies since 1999 topped \$117M last year, strong evidence that venture capitalists and financiers look favorably at Global IPP-supported technologies.



The following are some examples of recent program successes:



STOLAR HORIZON, NM
INSTITUTE OF MEASURING SYSTEMS RESEARCH, RUSSIA
SPEKTR, SNEZHINSK, RUSSIA
KANSAS CITY PLANT, MO
SANDIA NATIONAL LABORATORIES, NM

Products:

- Ø Drillstring radar for coalbed mining combines Russian radar, software, and mechanics with Stolar's sensor and antenna systems
- Ø Mine detection system incorporates Russian software and Stolar's sensor



Nonproliferation Impact:

- Ø 220 former Soviet nuclear weapons design specialists engaged in civilian R&D projects
- Ø 250 civilian jobs created or sustained in Russia that are now independent of Global IPP support
- Ø Joint Venture under development by Stolar and Russian partners

Commercial Success:

- \$7M in outside investment attracted by Stolar
- Ø \$50K in manufacturing revenues in Russia funded by Stolar
 - Ø 65 jobs created or supported in the U.S.



**NEW HORIZONS DIAGNOSTICS CORPORATION, MD
GAMALEYA INSTITUTE, MOSCOW, RUSSIA
GOSNIIOKHT, MOSCOW, MOSCOW STATE UNIVERSITY
PACIFIC NORTHWEST NATIONAL LABORATORY, WA**

Products:

- Ø Recombinant luciferase reagents for portable photodetectors to measure food safety and water quality
- Ø Biosensors for Express Detection and Discrimination of Ultra-low Concentration of Organophosphate Neurotoxins

Nonproliferation Impact:

- Ø 140 former Soviet WMD scientists and personnel engaged in civilian R&D projects
- Ø Two independent civilian businesses created in Russia employing former Soviet WMD personnel

Commercial Success:



- Ø \$140K in annual sales revenues for New Horizons Diagnostics
- Ø \$40K in annual sales revenues for Russian partners
- Ø Private and government customers in life sciences and homeland security industry

FELTON INTERNATIONAL, KS
CHEMICAL AUTOMATICS DESIGN BUREAU, VORONEZH, RUSSIA
KANSAS CITY PLANT, MO

Products:

- Ø Needle-Free Jet Injector
- Ø Novel Russian design disposable cap with disease-impermeable membrane for safe mass inoculations (600 injections per hour)
- Ø Reduces medical waste, eliminates needle-stick risk

Nonproliferation Impact:

- Ø 138 former Soviet scientific specialists from former missile technology institute engaged in civilian R&D projects
- Ø Independent Russian business created employing personnel from former missile delivery systems institute

Commercial Success:

- Ø \$6M in outside investment attracted by Felton
- Ø \$3M in annual sales revenues and 20 fulltime jobs for Felton, a U.S.

small business

- Ø \$250K in new commercial revenues for Russian partners
- Ø Sales in veterinary markets; human use pending FDA approval

**TECHNOLOGY COMMERCIALIZATION INTERNATIONAL, NM
NUCLEAR RESEARCH INSTITUTE (INR), TROITSK, RUSSIA
LOS ALAMOS NATIONAL LABORATORY, NM
BROOKHAVEN NATIONAL LABORATORY, NY**

Products:

- Ø TCI and INR become key suppliers of Sr-82 isotope used in clinical positron emission tomography (PET)
- Ø TCI sells Rb metal targets irradiated at INR in a co-production arrangement wherein LANL processes them into Sr-82

Nonproliferation Impact:

- Ø 167 former Soviet nuclear weapons specialists engaged in civilian R&D projects
- Ø 150 civilian jobs for former weapons personnel now supported by the joint business independent of Global IPP support

Commercial Success:

- Ø \$15M investment attracted from private and NM state sources



Ø \$800K in annual sales for TCI, \$516K in annual sales for INR

**SPECTRA GASES, NJ
KURCHATOV INSTITUTE, MOSCOW, RUSSIA
LAWRENCE LIVERMORE NATIONAL LABORATORY, CA**

Products:

- Ø C-13 isotope for the ulcer-causing bacteria H. pylori diagnostics
- Ø O-18 isotope for PET imaging procedures

Nonproliferation Impact:

- Ø 155 former Soviet nuclear weapons personnel at Kurchatov engaged in civilian R&D projects
- Ø 20 commercial jobs created and/or sustained in Russia now independent of Global IPP support
- Ø Independent Russian business created

Commercial Success:

- Ø \$70K in sales revenues and other value-added for Spectra Gases
- Ø \$60K in sales revenues for Kurchatov

**GLOBAL NUCLEAR FUEL – AMERICAS, NC
ULBA METALLURGICAL PLANT, KAZAKHSTAN
BROOKHAVEN NATIONAL LABORATORY, NY**

Products:

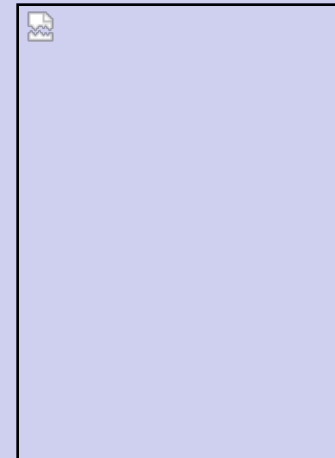
- Ø Unique capability for uranium scrap recovery and re-refining based on Ulba technology
- Ø U.S. partners established international quality and safety standards

Nonproliferation Impact:

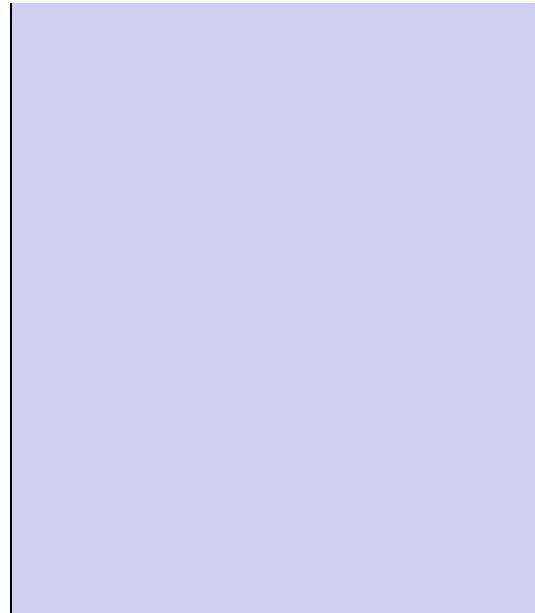
- Ø Ulba is a former Soviet nuclear weapons materials facility that was slated for shutdown in 1999 with thousands of workers to re-employ
- Ø 500 private sector jobs created and/or secured as a result of Global IPP project now sustained independently

Commercial Success:

- Ø \$5.5M in annual sales for Ulba (to Global Nuclear Fuel, French Cogema, Russian TVEL and Italian nuclear fuel company)



- Ø Sole source of cost-effective re-processing services for U.S. industry partner



**RWE NUKEM, CT / BRUSHWELLMAN, OH
ULBA METALLURGICAL PLANT, KAZAKHSTAN
LOS ALAMOS NATIONAL LABORATORY, NM**

Products:

- Ø CuBe master alloy production for electronic components: telecommunications, automotive, computers, optical media
- Ø Modernized arc furnace, personnel training, and ISO-9002 certification by U.S. partners

Nonproliferation Impact:

- Ø Former Soviet nuclear weapons materials facility slated for shutdown in 1999 with thousands of workers to re-employ
- Ø 130 commercial jobs created plus 300 former jobs re-established as a result of Global IPP project now sustained independently

Commercial Success:

- Ø \$2M in annual revenues for U.S. partners
- Ø \$5-\$6M in annual sales for Ulba
- Ø World's second largest source of commercial CuBe alloy



THORIUM POWER, WASHINGTON, D.C.
KURCHATOV INSTITUTE OF ATOMIC ENERGY, MOSCOW
LUCH SCIENTIFIC PRODUCTION ASSOCIATION, PODOLSK
BROOKHAVEN NATIONAL LABORATORY, UPTON, NY

Products:

- Ø New Radkowsky Thorium Fuel for light water reactors reducing plutonium in their spent fuel by 90%
- Ø Weapons-grade plutonium disposing fuel

Nonproliferation Impact:

- Ø 140 former Soviet nuclear weapons scientists and personnel engaged in civilian R&D project work
- Ø 500 jobs created and/or secured as a result of GIPP project now sustained independent of GIPP support

Commercial Success:

- Ø \$13.5M investment attracted from private sources
- Ø \$3.5M in annual revenues for Russian partners



UTC/PRATT & WHITNEY, CT
E. O. PATON ELECTRIC WELDING INSTITUTE, UKRAINE
OAK RIDGE NATIONAL LABORATORY, TN

Products:

- Ø Turbine Airfoil Welding Repair technology
- Ø Reduces original equipment manufacturing costs

Nonproliferation Impact:

- Ø 187 former Soviet scientific specialists at Paton Electric Welding Institute engaged in Global IPP civilian R&D projects
- Ø Joint venture Pratt & Whitney – Paton created
- Ø 30 private sector jobs created in Ukraine now sustained independent of Global IPP funding



Commercial Success:

- Ø \$1M investment attracted by Pratt & Whitney – Paton
- Ø \$150K in annual sales for U.S. partner
- Ø \$50K in annual revenues for Paton

**PARATEK MICROWAVE, MD
ST. PETERSBURG ELECTROTECHNICAL UNIVERSITY, RUSSIA
NATIONAL RENEWABLE ENERGY LABORATORY, CO**

Products:

- Ø Electrotechnical University assisted in the early development of the ParascanTM tunable material, the foundation of Paratek
- Ø U.S./Russian breakthroughs in ceramic materials, innovative radio frequency and antenna design
- Ø Ferroelectric phase shifters for communications systems

Nonproliferation Impact:

- Ø 90 former Soviet scientists with WMD experience at St. Petersburg Electrotechnical University engaged in civilian GIPP R&D projects
- Ø Independent Russian business created to employ former weapons specialists

Commercial Success:

- Ø \$68M venture capital investment attracted
- Ø \$4.9M in annual sales for Paratek
- Ø 41 full time jobs created in the U.S.



* All data is for 2004 as reported to the U.S. Industry Coalition (USIC); jobs are full-time and part-time combined. Outside investment is cumulative from start of an IPP project; information on ULBA/Kazakhstan revenues/jobs collected during IPP audit in early 2005.