

## **RUSSIAN TELECOMMUNICATIONS TASK ORDER FINAL REPORT**

**Descriptive title:** Final Report  
**Author's name:** Ian Freed Consulting, Inc.  
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**Task Order No.:** T.O. 7-0054-DTT  
**Project No.:** 110-0005  
**Project Title:** Privatization of Civilian and Defense Industries  
**T.O. Title:** Ian Freed Consulting, Inc.: Russian Telecommunications Task Order  
**Contractor's Name:** Deloitte Touche Tohmatsu ILA Group, Ltd.  
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### ***Ian Freed Consulting, Inc.***

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## EXECUTIVE SUMMARY

### BACKGROUND

In 1994 USAID issued a task order to Ian Freed Consulting, Inc. (IFCI) to create the telecommunications framework for market development projects in the Russian Federation. According to USAID Privatization Task Order for contract CCN-0005-C-00-3123-00 Task Order 7-0054-DTT, IFCI worked with Deloitte & Touche and Diasoft, Ltd. to develop a message generation, transfer and process system which managed the communications and data processing needs of newly developed clearing and settlement organizations in five regions of the Russian Federation.

In two years IFCI designed, developed and implemented the system required by the original task order, and fulfilled various other related consultative tasks for the RFSCC to deliver technologies and market models never before used in Russia. At the beginning of USAID's work in Russia, there was no automated system for listing share data, no system by which share registration data could be stored or transferred nor a means by which this data could be reliably and securely transferred. A system now exists which the Russian securities market can use to list, register, process and transfer data reliably and securely according to standard western models. Russia now has the tools to develop a lasting, stable capital market upon which national privatization can efficiently take place and a stable market economy can form.

### ACTIVITIES

Ian Freed Consulting, Inc. (IFCI) introduced a broad range of modern communications technologies and data processing/communications models that users in the Russian capital market are using to establish a stable, reliable infrastructure. Over the course of two years IFCI was able to help users with extremely poor knowledge of modern communications technology bring online a secure, reliable system of data transfer. With the help of this system, the Russian securities market is performing the following tasks:

- List shares available for trading with bid and ask prices according to an internationally accepted model,
- Transfer data and messages necessary to perform front and back office securities transactions in a secure and reliable manner, and
- Maintain data processing and communications systems in an industry-accepted manner to ensure data integrity, system reliability and optimum system performance.

Additionally IFCI achieved the following goals that guarantee long-term and effective use of the allocated resources:

- Guided local system management and users in the proper use and further development of resources,
- Trained local staff to continue system development with complete self-reliance,
- Established a framework which can help improve user and public confidence in the technologies necessary for modern capital markets,
- Implemented internationally accepted standards of message generation and formatting for continued compatibility as the market develops internationally, and
- Designed, developed, and implemented the appropriate systems to perform all necessary aspects of securities market data transfer and processing for the Russian Federation.

In the course of accomplishing the above goals, IFCI faced extensive technological, organizational and political difficulties. These difficulties were unavoidable when introducing new technologies in a new market formerly unexposed to securities trading practices, modern communications systems, reliable

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and secure data processing, and modern data systems management. IFCI was able to overcome most difficulties and can point to the following lessons learned for future similar projects:

1. A specific task in the Task Order should be the designation of an Authority by project sponsors and beneficiaries. This Authority should maintain full legal and administrative powers to make final, binding decisions on any issues related with the project.
2. The Authority should share full support of the beneficiary government (Russia) in its decisions and decision-making process, should be knowledgeable of the types and uses of the technology to be implemented and should have experience using the technology in the applicable fields.
3. The Authority must be easily accessible by those performing the actual development and implementation work.
4. Ideally the Authority would be a ministry with a group of experts responsible for overseeing the project and working with consultants and vendors. Representatives from the consulting firms who are performing the actual work would be ideal candidates for participation in such an expert group.
5. The consultant responsible for making recommendations to the above-mentioned Authority should have a mechanism by which it can appeal decisions made by the Authority. This appeal mechanism would allow for re-evaluation of decisions made by the Authority that are unrealistic, impossible or unreasonable for application to the systems and models recommended by the consultant.
6. A clear process of implementation must be established with sanctions for local participants when they fail to fulfill program tasks. Occasionally decisions regarding implementation of accepted and recommended systems and models could not be implemented because of interference or inaction by local project beneficiaries. Once the project consultants (or above-mentioned Authority) makes a project-related decision or recommendation, the local project beneficiaries must accept that decision and promptly begin implementation. The above-mentioned Authority could use a progressive series of warnings with the threat of the maximum sanction, removal from the development program and designation of a new local beneficiary.
7. The project requires a more effective decision-making body for administrative decisions related to project implementation. Decisions related to administrative project activities and consultant day-to-day activities were sometimes delayed or difficult due to unnecessarily complicated procedures or inaccessibility of project officers.
8. Legislative action by the host country should support the project. The legislative action would serve as a basis for future decisions and project implementation. A legislative basis would also provide a more stable environment within which the project would progress. In this manner, consultants could better anticipate or possibly avoid host government decisions that affect successful project implementation.

These recommendations are related primarily to the project as a whole, particularly to administrative portions. IFCI makes additional technical and topic-specific recommendations below according to individual locations and activities.

In the section *Project Tasks and Accomplishments*, each phase of the original task order is quoted in italics and follows the heading *Task*. The consultant's activities relevant to these tasks follow the quotation with a numbered heading in the format *1a Accomplishments*, the number corresponding to the task order section and the letter to the individual task within that section.

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## PROJECT TASKS AND ACCOMPLISHMENTS

### 1.0 PHASE I, RESEARCH AND DEVELOPMENT

#### TASK:

##### 1. RESEARCH AND DEVELOPMENT

*The Consultant will perform the following four activities:*

A. *research and recommend standard telecommunications protocols and providers for the system and standards specifications for software. Communications protocols investigated may include but are not limited to:*

- *X.25 X.75 packet switching*
- *Direct "leased line" connections*
- *Dial up modem connections*
- *Satellite connections if necessary*
- *Fiber connections (as they become available and necessary)*

*Providers' services will be examined for reliability, compatibility with various system designs, data throughput (9600 bit per second minimum), comprehensive geographic coverage, diagnostic capabilities, technical support and cost.*

Note: The RFSCE extended this task to establishing an all-Russian trading system (RTS) for real-time securities trading and listing. Accomplishments related to the RTS are included in the general accomplishments for CSO-related activities.

#### 1A ACCOMPLISHMENTS:

Ian Freed Consulting, Inc. investigated local, national and international providers to provide each CSO and its regional users with the most appropriate communications infrastructure available. During the course of our work Ian Freed Consulting has re-evaluated each location several times to ensure users were aware of and could make use of advances in infrastructure capability. The research produced the following recommendations for each location:

IFCI consulted the RFSCE on a general system design and implementation plan for the first Russian real time electronic securities trading system, launched in four pilot sites and extended to 15 other cities.

IFCI investigated services provided by local, national and international telecommunication providers to identify the most appropriate local and long-distance telecommunication providers for Russian Trading System members. IFCI identified equipment providers for four pilot local telecommunication hosts, conducted tenders and oversaw equipment delivery and installation.

#### **Moscow**

Moscow CSO management asked IFCI to evaluate two locations. After establishing the infrastructure for CSO activities at one location, Moscow CSO management decided to relocate and IFCI had to re-evaluate and reconfigure a new location. The Moscow CSO initially installed high-quality dial-up lines for all of its communications needs. The recommendations and tasks included:

- Installing high-quality dial-up lines,
- Integrating serially dialed numbers into an upgradeable PBX,
- Dedicated leased line service installation for data transfer,
- Redundant communications channel installation for maximum reliability, and
- X.25 Service installation to integrate national CSO services CSO users, Russian Trading System (RTS) services and RTS users into a nation-wide x.25 system for access to central data processing centers and inter-regional communications.

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For the central Russian Trading System node in Moscow, IFCI performed the following tasks:

- Leased line service consultation and selection between brokers' offices and the Moscow RTS telecommunications host, and
- X.25 provider selection and solution consultation for nation-wide data transfer via high-speed leased lines ensuring reliable, efficient communications between the regions and the central computer located in Moscow.

Ian Freed Consulting also investigated other fiber optic, radio-relay and packet-switched communications solutions that proved unrealistic based on price versus services offered.

### **St. Petersburg**

Faced with poor local infrastructure in the St. Petersburg CSO's region, Ian Freed Consulting recommended basing more services on commercial data-service providers. The recommendations included:

- Alternate dial-up service provider for high-quality national dial-up modem transfer (ISKRA-2, a secondary national telephone network formally for government use only),
- Local dial-up services,
- Dedicated leased line service installation for data transfer,
- Redundant communications channel installation for maximum reliability, and
- X.25 Service as the primary data-transfer medium to integrate national CSO services, CSO users, Russian Trading System (RTS) services and RTS users into a nation-wide x.25 system for access to central data processing centers and inter-regional communications.

For the RTS in St. Petersburg, IFCI performed the following tasks:

- Evaluated, recommended and selected high-quality leased line services between RTS users and a regional RTS host.

Recent advances in the St. Petersburg telecommunications infrastructure and financial support from city government agencies allowed the St. Petersburg CSO to connect to a frame-relay fiber-optic network for local communications between major capital market organizations.

### *Opportunity*

Work with the St. Petersburg city government to integrate as many services as possible into the fiber-optic network installed for other uses. The fiber optic backbone could additionally include major banks and brokerage houses that frequently use CSO services. As services become available, the St. Petersburg backbone could be integrated into a St. Petersburg-Moscow fiber backbone for improved inter-regional communication and service reliability. Using this state-of-the-art technology, the St. Petersburg CSO could serve as a model for the future of CSOs in Russia.

### **Ekaterinburg**

Faced with an exceptionally poor local infrastructure in the Ekaterinburg CSO's region, Ian Freed Consulting recommended a complex data communications system to achieve minimum requirements for this task order:

- Alternate dial-up service provider for high-quality national dial-up modem transfer (ISKRA-2, a secondary national telephone network formally for government use only),
- Local dial-up services,
- Dedicated leased line service installation for data transfer,
- Redundant communications channel installation for maximum reliability,
- Private x.25 network between the CSO and a city district with reasonably good telephone service for remote dial-up x.25 service as the primary data-transfer medium, and
- Integration into a commercial x.25 service to integrate national CSO services, CSO users, Russian Trading System (RTS) services and RTS users into a nation-wide x.25 system for access to central data processing centers and inter-regional communications.

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For the RTS in Ekaterinburg, IFCI performed the following tasks:

- Evaluated, recommended and selected high-quality leased line services between RTS users and a regional RTS host.

#### *Opportunity*

Use the installed x.25 network and additional experience acquired by the local staff using this equipment to speed local integration into the RTS. The experiences in Ekaterinburg can serve as a model for nationwide integration of CSOs and the RTS into a unified system based on available x.25 services.

#### **Novosibirsk**

Considering the low level of market activity in this region, Ian Freed Consulting recommended basic services until the market further develops. The recommendations included:

- Alternate dial-up service provider for high-quality national dial-up modem transfer (ISKRA-2, a secondary national telephone network formally for government use only), and
- Local dial-up services.

For the RTS in Novosibirsk, IFCI performed the following tasks:

- Evaluated, recommended and selected high-quality leased line services between RTS users and a regional RTS host.

#### *Opportunity*

As the local market develops, the CSO may install services such as those in Ekaterinburg. Offering market participants the option of accessing the regional CSO via already established communications networks (e.g. Sprint x.25) would accelerate and simplify the task of offering reliable, quality access. To accomplish this the Novosibirsk CSO should establish a working relationship with one or more local major x.25 or other distributed network access services.

#### **Vladivostock**

Ian Freed Consulting's recommendations for Vladivostock focus on improving an existing system. The recommendations reflect the regions active market combined with a very remote region.

- Alternate dial-up service provider for high-quality national dial-up modem transfer (ISKRA-2, a secondary national telephone network formally for government use only),
- Local dial-up services,
- Dedicated leased line service installation for data transfer,
- Redundant communications channel installation for maximum reliability,
- Satellite-based service for high-speed integration into the national network and central data-processing centers, and
- Additional recommendations related to system design, use and management.

#### *Opportunity*

The Vladivostock exchange has made considerable accomplishments working on their own. Their experiences dealing with overcoming technological and administrative hurdles can serve as models for a nationwide system. With appropriate guidance from experienced specialists, the Vladivostock system can maintain a leading role in the future of a nationwide CSO system.

#### *Lessons Learned*

Local talent is usually well equipped to develop systems that fulfill local needs. With additional guidance and professional consultations from experienced specialists, local models can serve as the basis for global systems. Local users are more willing to accept locally developed technology and administrative models than completely foreign administration models.

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**TASK:**

- B. *Design a telecommunications system and produce a system design and implementation plan, and review the plan with the RFSCE USAID and others involved in implementing the market development activities. The telecommunications system for each related Project will necessarily be different as each Task Order has different needs. For example, a system for transferring share registry data must have the capacity to send large data files over a relatively long time frame (8-24 hours) while a system of updating bid/ask data must transfer short bursts of information in seconds or minutes.*

**1B ACCOMPLISHMENTS:**

Ian Freed Consulting's telecommunications system design reflects variations in local infrastructure, individual market needs and anticipated applications. The recommended design is modular and flexible to allow for rapid changes in market needs. Each component is independent to allow simple upgrades based on capacity and infrastructure changes. The system can use high and low-speed dial-up or dedicated leased-line services through any transport medium and all major protocols.

*Lessons Learned*

It is impossible to accurately anticipate the speed of local infrastructure development and the learning curve of new technologies in a market that has no experience with such technologies. Therefore many technologies implemented out of necessity today may become obsolescent in only six months. Any project must have room for constant re-evaluation of needs and opportunities with appropriate administrative flexibility to adapt to rapid change.

**TASK:**

- C. *As appropriate, develop the file transfer management software and messaging software. Again, as needs for each project are identified, the consultant, working with other advisor, will determine whether file transfer and messaging software needs to be developed, or whether off the shelf packages can provide the necessary capabilities. Off the shelf packages would likely use Zmodem, UUCP/UUPC or FTP transfer protocols.*

**1C ACCOMPLISHMENTS:**

Ian Freed Consulting authored custom messaging and file transfer management software to reflect the specifics of the Russian market. Wherever possible, Ian Freed Consulting used off-the-shelf components, for example UUCP/UUPC for file transfer, PGP for encryption and message verification, and standard UNIX modules for various portions of the software interface and functions.

*System Weaknesses/Vulnerabilities*

Rapid changes in telecommunications infrastructure in Russia and throughout the world offer improved solutions for key portions of the data transfer system. UUCP/UUPC communications modules as implemented by IFCI do not fully take into account the possibilities of modern data transfer practices over TCP/IP networks.

The standards available for messaging systems did not originally include the possibility of using a non-Latin-based alphabet. The SWIFT standard as implemented in the current system has been in some cases adapted for the local market, which could lead to conflicts in the future. Ideally the system should use a genuine international standard, or barring that, a commission of users and administrators should agree on a subset of an international standard. A central agency such as the RFSCE could publish the subset and submit it to an international organization such as SWIFT for official approval.

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**TASK:**

- D. Oversee the Development or selection of encryption software for telecommunications. Encryption software is necessary for most (if not all) file transfer systems. The complexity of the encryption schemes will be appropriate for the needs of Market Development Project, with an assessment of whether different encryption will be used for each different project.*

**1D ACCOMPLISHMENTS:**

Ian Freed Consulting recommended a standard, high-security public key encryption and electronic signature package into the communications and messaging software developed for CSOs and CSO members.

**Work required:**

Implement encryption and public key software licensed for Russia.

At the time software development took place, there was no known relevant legislation anticipated or in effect regarding the use of encryption and public key software. Since program implementation began, the Russian government put into place legislation mandating the use of encryption and electronic message verification for all financial data. The legislation also mandates using algorithms licensed by the Russian government, but as of project termination, there was no hardware or solution available from the Russian government that could be implemented.

*Lessons Learned*

Anticipated legislative decisions that directly affect a project of this depth should be evaluated by the consultants before they are made. With an appropriate authority which is fully supported by the government, decisions such as that to make internationally-accepted standard encryption and message content/sender verification illegal might be avoided, or at least made with appropriate alternatives considered. In this case a major system element necessary for the entire system's ability to perform the intended tasks has been legislatively blocked with no clear alternative made available.

The decision to require secure transmission for financial data is appropriate and desirable, but the decision to make internationally-accepted means of fulfilling data integrity requirements illegal, coupled with the absence of locally-produced legal alternatives, is very unfortunate for the financial industry as a whole.

*System Weaknesses/Vulnerabilities*

The system's ability to deliver data reliably and securely is in question based on the Russian government's legislative action. If internationally-accepted standards are not appropriate for Russia, an alternative should be offered. The alternative offered has so far been impossible to implement due to the bureaucratic requirements of using the alternative and the technological limitations of the alternative.

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## PHASE 2, TELECOMMUNICATIONS PILOT

Additional telecommunications pilot information is located in Appendix A, *Telecommunications Pilot Program Report*.

### TASK:

#### 2. TELECOMMUNICATIONS PILOT

*The consultant will perform a pilot implementation of the systems at one or more sites. Consultant activities will include:*

A. *Overseeing the functioning of the equipment, including diagnosis and report of problems on site and training local telecommunications specialists in maintenance. Equipment to oversee may include, but not be limited to the following:*

- *Workstations*
- *printers*
- *file servers*
- *communication servers*
- *modems*
- *CSU/DSUs*
- *routes*
- *bridges*
- *gateways*
- *hubs*
- *multi-port boards*
- *terminal servers*

#### 2A ACCOMPLISHMENTS:

Ian Freed Consulting began a pilot broker training program in each region. The program tests the application of all system components, including software, hardware and provider services. As part of this pilot program, IFCI delivered modems, documentation and training materials to system administrators and users. Additionally, individual staff members from each region took part in specialized UNIX and system administration training.

IFCI oversaw line installation, equipment procurement, installation and testing of the Russian Trading System. IFCI oversaw the Russian Trading System start up, consulted PAUFOR, its Technical Center and local technical support staff at pilot sites during RTS development and expansion to other regions.

### TASK:

B. *Work closely with distributed users of the system(s) by the Advisors to the Market Development Project.*

#### 2B ACCOMPLISHMENTS:

During all phases, IFCI traveled to each region specifically to install necessary system components and train administrators, technicians and users. During the pilot program, IFCI selected groups of users and performed installation and application training to familiarize system users and administrators with the system.

### TASK:

C. *Providing Pilot site(s) with telecommunications lines and modems and closely oversee training and installation at these sites.*

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**2C ACCOMPLISHMENTS:**

IFCI provided modems and communications channels to all participants, either by selecting special services where other channels were not available or installing the system such that existing services could be used.

**TASK:**

*D. Developing a training and site preparation materials during the pilot(s) for use in implementation.*

**2D ACCOMPLISHMENTS:**

IFCI developed extensive training and demonstration materials specifically for the pilot program and for implementation.

**TASK:**

*E. Providing a written report on the pilot(s)*

**2E ACCOMPLISHMENTS:**

The written report is attached as Appendix A.

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## PHASE 3, IMPLEMENTATION

### TASK:

#### 3. IMPLEMENTATION

*After the pilot site(s) for a market Development Project have been installed, The Consultant will implement the telecommunications system at the number of sites agreed to with the RFCSE and the advisors to the Project. At these additional sites, the Consultant will, as appropriate:*

- A. *Train local technical personnel to implement the system. Training will include use of the messaging and communications system hardware and peripherals, as well as system diagnostics.*

#### 3A ACCOMPLISHMENTS:

Ian Freed Consulting sent local personnel to professional training seminars. Additionally Ian Freed Consulting technical specialists traveled to each of the sites to train local personnel in site-specific applications and system components.

After RTS startup, IFCI technical specialists traveled to an additional 15 cities to identify local broker needs, test their communications lines and make appropriate recommendations for improving service.

### TASK:

- B. *Procure equipment necessary for implementations (see above equipment lists).*

#### 3B ACCOMPLISHMENTS:

Ian Freed Consulting procured or oversaw procurement of all necessary equipment.

#### *Lessons Learned*

To reduce the cost of equipment procurement, the consultant should have a tax status which is appropriate for a technical aid organization. To this end, the consultant should have a simplified procedure for purchasing equipment on-site from local vendors with reduced taxes and/or customs duties. Ideally, the consultant should have the necessary documents to make purchases and/or import equipment without any customs duties or taxes and should not require additional paperwork for tax-free purchase requests (similar to organizations with diplomatic status). To provide contractors with tax and duty-free status, USAID issued documents to Ian Freed Consulting, Inc. These documents were not legally binding in the Russian Federation and in several instances local vendors refused to honor these documents and charged VAT and other taxes on services and products.

### TASK:

- C. *Oversee the installation of telecommunication lines. Telecommunications line installation oversight includes:*

- *scheduling of line installation*
- *identification of line installation locations*
- *site readiness preparation*
- *site meetings with local personnel*
- *identification of dedicated and dial-up lines.*

#### 3C ACCOMPLISHMENTS:

Ian Freed Consulting identified appropriate line services for each region and oversaw line procurement. The lack of permanent or semi-permanent locations in some regions seriously delayed installation schedules and delayed system start-up.

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*Lessons Learned*

Delays associated with locating new premises for CSOs hindered all aspects of system development. The difficulties included:

- Difficulty reaching the relevant staff at CSOs to discuss project details,
- Lack of a permanent address where communications services could be installed,
- Lack of appropriate office space where communications equipment could be installed, and
- Unstable operations at CSOs based on lack of appropriate office space for day-to-day duties, leading to delays in the overall development of CSOs.

The consultant should have a process similar to that recommended above for equipment procurement to acquire communications services tax free.

The consultant should maintain special permission to evaluate objects relative to their project's objectives. For this project, the consultant did not have the right to physically inspect "secret" premises such as telephone stations. The consultant required access to telephone stations to install and configure communications equipment.

**TASK:**

*D. Install telecommunications and messaging software. Telecommunications and messaging software installation includes:*

- *configuring workstations operating system software*
- *loading telecommunications and messaging software*
- *loading encryption software*
- *integrating system software on site*
- *testing software in site environment*

**3D ACCOMPLISHMENTS:**

Each location received distribution media and accompanying documentation for installation and use. Using these materials, IFCI specialists installed software on location to ensure local users and administrators could perform the same tasks in IFCI's absence. After installation and training, IFCI tested the installed system to ensure the system operated as intended.

**TASK:**

*E. Provide documentation. The consultant will provide installation and user documentation for all software. The consultant will produce written specification for the system and provide them upon RFSCCE's Request to institutions interested in participating in the system. Documentation may include, but not limited to, user documentation, system documentation and maintenance documentation*

**3E ACCOMPLISHMENTS:**

IFCI provided all necessary documentation. A copy of all documentation was additionally provided to each CSO on electronic media as data files for future editing, modification or distribution. During the course of the project IFCI submitted system specifications and, in some cases, source text to several institutions. The documentation and other relevant documents are available in Russian from IFCI in Microsoft Word for Windows 6.0 format at URL <http://www.ifci.ru/cso/>.

**TASK:**

*F. Train the staff at each implementation site in the use and maintenance of the telecommunications system. Staff will be trained to use software, hardware, peripherals and communications systems as needed.*

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**3F ACCOMPLISHMENTS:**

Ian Freed Consulting conducted necessary training and organized professional training for regional technical staff in Moscow at leading technical institutes. IFCI traveled to regional CSOs to train local brokers, administrators and technical staff on installed equipment (additional information is located in Appendix A, *Telecommunications Pilot Program Report*).

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## PHASE 4, POST-IMPLEMENTATION SUPPORT

### TASK:

#### 4. POST-IMPLEMENTATION SUPPORT

*The Consultant should provide on-going operational and technical assistance to users of the system for several months after implementation. Such assistance should include:*

- A. Central Technical Help Desk. The help desk will initially be manned by the Consultant, but the consultant will train local support staff to maintain a permanent help desk.*

#### 4A ACCOMPLISHMENTS:

Ian Freed Consulting has the necessary infrastructure in place for post-implementation support. IFCI maintains a central help desk at its Moscow offices. The help desk is available via mail, telephone, fax, e-mail or WWW during regular office hours. IFCI trained regionally based support staff to be self-sufficient. Additionally, the regional staff has contact information for all other staff involved in the project in order to take advantage of varying knowledge at each location nation-wide.

### TASK:

- B. Software maintenance. As software enhances, incompatibilities and bugs are identified, the consultant will modify and upgrade messaging and communication software as appropriate. As new off the shelf versions of software are released, the Consultant will determine whether the benefits from the upgrade, as well as costing, are warranted.*

#### 4B ACCOMPLISHMENTS:

IFCI continues to support the system and document changes. As new versions of off-the-shelf software have become available, IFCI has recommended and implemented changes to its software to take advantage of improvements.

### TASK:

- C. Coordination of communication standards. The consultant will coordinate communications standards among all system participants, including communication protocols, site and user identifies.*

#### 4C ACCOMPLISHMENTS:

IFCI has coordinated the implementation of standards wherever possible. The message format is based on SWIFT standards and the communications modules are based on standard protocols such as TCP/IP, x.25, UUCP/UUPC, etc.

#### *System Weaknesses/Vulnerabilities*

Without the direct authority to make global, final decisions for the entire system, it is very difficult to maintain standards or coordinate activities.

#### *Lessons Learned*

Ideally the project should have a coordinated project leadership authority (see also points 1-8 in the executive summary) which makes nationwide decisions based on input from all involved parties.

### TASK:

- D. Assistance to other institutions that want to join the system. The Consultant will provide technical assistance to other organizations (not yet identified) that wish to join the system.*

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#### 4D ACCOMPLISHMENTS:

Throughout the project, IFCI provided technical assistance to all organizations involved with the system. This included individual users, regional exchanges, regional banking organizations, regional governments, commercial organizations serving the technical needs of system users and others.

#### TASK:

*The consultant should work with the RFCSE and other advisors to identify a coordinating entity which would be appropriate to assume this role. The consultant will then transfer responsibility for on-going support to this entity.*

#### 4 ACCOMPLISHMENTS:

The RFSCE and the PAUFOR (Moscow brokers self-regulating organization) technical support branch are the coordinators for on-going support and project guidance. Additionally, a users' group made up of staff the technical support departments from each of the CSOs pools knowledge and experience to provide each other with on-going support.

#### *System Weaknesses/Vulnerabilities*

The transition to a fully self-supporting organization with appropriate technical knowledge, objective program direction and adequate administrative capabilities is proving difficult. A qualified and truly objective organization that could take over this role does not exist.

#### *Lessons Learned*

Ideally the project should have a coordinated project leadership authority (see also points 1-8 in the executive summary) which includes a technical guidance council.

#### *Opportunity*

The president of the Vladivostock International Stock Exchange, Mr. Sakharov, is now an influential member of the RFSCE. The positive technical and administrative results achieved by Mr. Sakharov's organization in Vladivostock before USAID's involvement, indicates that Mr. Sakharov would make a good candidate for a director of a nation-wide support/guidance council. Members of this council should include select technical staff from each region (see points 1-8 in the executive summary).

## CONCLUSION

The objectives put forward in the original task order for establishing CSOs in major regional centers with the appropriate technical infrastructure to perform market-related data communications and processing have been achieved. Although weaknesses remain and the system as a whole is still underutilized, a stable, reliable basis for an effective and modern market exists.

The RFSCE should consider additional investment in the securities market infrastructure. With professional guidance, the RFSCE could take advantage or additional opportunities to develop a modern securities market by providing the Russian financial sector with tools already in use worldwide: Live western market news feeds for Russian brokers, software tools for market analysis and automated securities management, electronic information resources for publishing Russian market data to potential investors outside Russia, etc.

To ensure further development of the market in a positive direction, USAID or another influential agency should use its good relations with the RFSCE and system beneficiaries to encourage the development of a qualified, objective oversight/guidance Authority. The Authority can offer expert administrative, operational and technical direction. From a technical standpoint, the system is ready to support a successful securities market.

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# APPENDIX A

## TELECOMMUNICATIONS PILOT PROGRAM REPORT

Presented by:  
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## BACKGROUND

As part of the project to develop capital markets in the Russian Federation, USAID issued USAID Privatization Task Order for contract CCN-0005-C-00-3123-00 Task Order 7-0054-DTT for the period 01-July-94 to 31-July-95. The task order sets forth objectives to form the framework of a modern, stable securities market. Working with Deloitte & Touche, Diasoft, the Russian Federation Commission on Securities and Exchanges (RFSCCE) and project beneficiaries, Ian Freed Consulting, Inc. (IFCI) designed, developed and implemented a data processing and transfer system that will serve as the basis for modern securities market transactions in the Russian Federation.

The system, which regional clearing and settlement organizations (CSOs) throughout the Russian Federation will use, provides reliable and secure message generation, processing and transfer for share registry and listing services. CSOs will use the system to perform transfer of share ownership, ownership listing and payment functions for the Russian Federation securities market.

According to the USAID Task Order, the consultant should perform a pilot implementation of the system at one or more sites and report on the results of the pilot program. This report describes the pilot implementation IFCI performed and satisfies point E. of section 2. *Pilot Implementation* for the above-mentioned task order.

The report's format includes original text from the task order quoted in italics. The consultant's activities relevant to each quotation follow the relevant section with a numbered heading in the format *2a Activities*, the number corresponding to the task order section and the letter to the individual task within that section.

## PILOT IMPLEMENTATION REPORT

### 2. TELECOMMUNICATIONS PILOT

*The consultant will perform a pilot implementation of the systems at one or more sites. Consultant activities will include:*

*A. Overseeing the functioning of the equipment, including diagnosis and report of problems on site and training local telecommunications specialists in maintenance. Equipment to oversee may include, but not be limited to the following:*

- *Workstations*
- *printers*
- *file servers*
- *communication servers*
- *modems*
- *CSU/DSUs*
- *routes*
- *bridges*
- *gateways*
- *hubs*
- *multi-port boards*
- *terminal servers*

### 2A ACTIVITIES:

IFCI representatives installed, configured and tested the complete system solution in Moscow, St. Petersburg, Novosibirsk and Ekaterinburg. Following installation, IFCI representatives monitored equipment use via remote access, site visits and local staff reporting to isolate and abate errors or difficulties. In addition, IFCI continued software development and testing at its offices to improve overall system performance and features. During the pilot implementation

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phase, IFCI updated regional sites' software and hardware to reflect improvements made throughout development and testing.

Each site visit followed a site preparation plan detailing key objectives, trip agenda and involved personnel. IFCI prepared the plan in conjunction with all other involved parties. Following the first trip to install, configure and test equipment and train staff, IFCI made repeat trips to assess and abate specific problems or implement new features/versions. To finalize each trip, IFCI and local staff agreed on a trip assessment and detailed unresolved issues for future work.

**TASK:**

- B. Work closely with distributed users of the system(s) by the Advisors to the Market Development Project.*

**2B ACTIVITIES:**

At each location, IFCI worked with a group of broker/participants selected by the local CSO. Each selected participant received the necessary hardware, software and documentation to initiate trading-related activities from their offices. IFCI and CSO representatives conducted installation and training at the participants' offices and verified system functionality. After IFCI's departure, these participants had the opportunity to use the system in real-time, performing necessary activities to settle and register trades on their regional exchanges. IFCI encouraged participants to make suggestions regarding system functionality and use. IFCI implemented user suggestions wherever possible.

**TASK:**

- C. Providing Pilot site(s) with telecommunications lines and modems and closely oversee training and installation at these sites.*

**2C ACTIVITIES:**

IFCI provided modems and communications channels to all participants, either by selecting special services where other channels were not available or installing the system such that existing services could be used.

**Moscow**

IFCI recommended dial-up services for most participants. Moscow telephone services are reliable and modem connections can be made at speeds up to 28.8 kbps with v.34 modems. Some participants requested leased-line services at their own expense and IFCI representatives recommended appropriate services.

At the Moscow CSO IFCI arranged installation of dial-up and leased line services for all project needs. In addition, IFCI procured and oversaw installation of a PABX to better utilize the multiple incoming lines.

**St. Petersburg**

IFCI recommended dial-up x.25 service through a regional x.25 service provider for most participants. St. Petersburg telephone service is much worse than in Moscow, but high traffic at the CSO was anticipated. IFCI procured the appropriate services and configured the local server with a leased-line connection to the regional x.25 provider. Using the distributed x.25 network, participants can usually dial a local number from anywhere in the region for reliable access to the St. Petersburg CSO.

**Ekaterinburg**

The Ekaterinburg CSO's local telephone station proved unreliable for data transfer. IFCI procured and installed a private x.25 network between the CSO and a remote telephone station with reasonable quality. Local participants may use dial-up or leased-line x.25 services for

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access to the Ekaterinburg CSO. For a parallel project, IFCI recommended leased-line services for Russian Trading System participants in the Ekaterinburg region. Since all Ekaterinburg CSO clients are also members of the Russian trading system, IFCI was able to utilize resources from the parallel RTS project to offer high-quality x.25 services between the CSO and its clients. IFCI representatives configured the CSO's private network to integrate with the RTS x.25 network to allow data transfer between them.

### **Novosibirsk**

IFCI deemed local dial-up service adequate for Novosibirsk. The local network, although of relatively poor quality, fills the limited needs of the Novosibirsk CSO. In the future, the Novosibirsk CSO may use the Ekaterinburg model to integrate its network with the RTS, allowing data transfer through a network already established to most of its clients. IFCI assisted the Novosibirsk CSO with local dial-up service selection and testing.

### **Vladivostock**

The Vladivostock network already utilizes dial-up and leased-line services between the exchanges, CSO and their participants. IFCI made recommendations on how the Vladivostock network may migrate to more advanced services.

### **TASK:**

- D. Developing a training and site preparation materials during the pilot(s) for use in implementation.*

### **2D ACTIVITIES:**

IFCI developed extensive training and site preparation materials for system start-up and maintenance. The materials are available for downloading at URL <http://www.ifci.ru/cso/>.

## **CONCLUSION**

The pilot implementation for the CSO data system development project fulfilled the major tasks of the entire project. Pilot project results allowed IFCI to make necessary changes to the software and hardware configurations for each site before final implementation. The changes adapted the standard system to work best in each region, offering the best available services for all participants. Each location presented special needs that offer unique solutions to the same objectives. Each solution can serve as a model for other projects that may present similar data processing and communications needs.

For projects of this scope, IFCI stresses the importance of pilot implementations at every location. The vast territorial distances, local infrastructure qualities and varying staff qualification level of each region limit the effectiveness of a turn-key approach to telecommunications solutions in Russia. For future projects, effort estimates should always consider a region-by-region pilot program.

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