

EXPANDING TECHNOLOGICAL COOPERATION WITH THE SOVIET UNION  
SEPTEMBER 22, 1988

GOOD AFTERNOON! HAVING BEEN A PROPONENT OF EXPANDING TECHNOLOGICAL COOPERATION WITH THE SOVIET UNION FOR NEARLY TWENTY YEARS, I WELCOME THE OPPORTUNITY TO SPEAK ON THAT SUBJECT.

EVENTS DURING THE PAST THREE YEARS, AND ESPECIALLY IN THE PAST SIX MONTHS, HAVE STARTED A MOVEMENT TOWARD BETTER RELATIONSHIPS BETWEEN THE U.S. AND THE SOVIET UNION. THIS IS EVIDENCED IN PART BY THE JUNE SUMMIT WHERE PRESIDENT REAGAN SAID HE NO LONGER BELIEVES THE SOVIET UNION IS AN EVIL EMPIRE, BUT A COUNTRY WILLING TO WORK FOR PEACE. THIS DRAMATIC SHIFT IN U.S. ATTITUDE IS, OF COURSE, LARGELY DUE TO THE SOVIET POLICIES OF GLASNOST AND PERESTROIKA, WHICH ARE BRINGING ABOUT FUNDAMENTAL CHANGES IN SOVIET SOCIETY, WITH MANY FAR-REACHING EFFECTS, INCLUDING THE CREATION OF AN ENVIRONMENT THAT IS MORE CONDUCTIVE TO TECHNOLOGICAL COOPERATION THAN EVER BEFORE.

I WAS IN MOSCOW IN JUNE WITH A MINNESOTA TRADE MISSION, AND IT WAS EVIDENT THAT GREAT CHANGES HAD OCCURRED SINCE MY PREVIOUS TRIP TO THE SOVIET UNION TO ATTEND THE MOSCOW PEACE FORUM IN FEBRUARY 1987. ONE EXAMPLE WAS THE GREATER

WILLINGNESS OF SOVIET OFFICIALS TO DISCUSS -- AND EVEN CRITICIZE -- THE CHANGES ACCOMPANYING PERESTROIKA. I MET WITH MANY SOVIETS WHO SPOKE FAVORABLY ABOUT POLITICAL, ECONOMIC AND SOCIAL REFORMS EVEN THOUGH FRUSTRATED OVER THE DELAY AND CONFUSION WITH IMPLEMENTATION. IN CONTRAST, WHEN I WAS THERE 15 MONTHS EARLIER, THERE WAS RELUCTANCE TO FREELY DISCUSS THE IMPLICATIONS OF PERESTROIKA. MOST IMPORTANTLY, I SENSED A BETTER FEELING BY THE SOVIET SIDE TOWARD THE U.S. AS ONE SOVIET OFFICIAL SAID, "WARM WINDS ARE NOW BLOWING ON US-USSR RELATIONSHIPS."

HOWEVER, ONE NOTICEABLE FEATURE OF SOVIET LIFE HADN'T CHANGED SINCE MY FEBRUARY 1987 TRIP, AND THAT WAS THE LONG LINES OF PEOPLE WAITING TO BUY VODKA. AS YOU PROBABLY KNOW, PART OF GORBACHEV'S PROGRAM IS TO DECREASE THE CONSUMPTION OF ALCOHOL BY REDUCING THE HOURS THAT VODKA IS AVAILABLE. HENCE, THE REASON FOR THE LONG LINES. THE RUSSIANS TELL THE STORY OF THE MAN STANDING IN A LONG VODKA LINE IN MOSCOW WHO BECAME SO FRUSTRATED THAT HE ANNOUNCED TO HIS FRIEND THAT HE WAS LEAVING FOR THE KREMLIN TO SHOOT GORBACHEV. AFTER ABOUT AN HOUR, HE RETURNED. WHEN ASKED WHAT HAPPENED, HE REPLIED THAT THE LINE AT THE KREMLIN WAS THREE TIMES AS LONG AS THE VODKA LINE.

FORTUNATELY, THE DECREASED AVAILABILITY OF VODKA DOESN'T DETRACT FROM THE IMPROVING ENVIRONMENT FOR TECHNOLOGICAL COOPERATION.

### SOVIET SCIENCE & TECHNOLOGY ESTABLISHMENT

BEFORE DISCUSSING THAT SUBJECT, IT IS DESIRABLE TO REVIEW A FEW HIGHLIGHTS ON THE VERY EXTENSIVE SOVIET SCIENCE AND TECHNOLOGY ESTABLISHMENT. THESE INCLUDE:

- o THE SOVIET UNION HAS MORE SCIENTISTS AND ENGINEERS ENGAGED IN RESEARCH AND DEVELOPMENT THAN ANY OTHER COUNTRY.
- o THERE ARE OVER 5,000 RESEARCH INSTITUTES IN THE SOVIET UNION.
- o THE SOVIET UNION IS A WORLD LEADER IN A NUMBER OF SCIENCE AND TECHNOLOGY AREAS. A HIGHLY PUBLICIZED EXAMPLE IS SPACE TECHNOLOGY. (NEED A BETTER SLIDE, I.E., COSMONAUT)
- o PRECISE COMPARISONS BETWEEN SOVIET & U.S. OVERALL R&D EXPENDITURES ARE DIFFICULT TO MAKE BECAUSE OF DIFFERENCES IN ACCOUNTING SYSTEMS, LESS RELIABLE SOVIET STATISTICS AND UNCERTAINTY OVER HOW MUCH MILITARY-RELATED SCIENCE IS INCLUDED IN FIGURES

PUBLISHED FOR TOTAL R&D. HOWEVER, THE BEST STATISTICS AVAILABLE FROM U.S. GOVERNMENT SOURCES SHOW THAT THE SOVIET UNION SPENT 3.8% OF ITS GNP ON R&D IN 1986, COMPARED WITH ONLY 2.8% BY THE U.S. IN THE SAME PERIOD.

- o THE SOVIET UNION REALIZES A VERY LOW RETURN ON ITS HUGE AND CONTINUING INVESTMENT IN RESEARCH BECAUSE OF LACK OF COORDINATION AMONG THE LARGE NUMBER OF RESEARCH INSTITUTES AND BECAUSE OF CENTRALIZED ECONOMIC PLANNING, IN WHICH RESEARCH RESPONDS TO GOVERNMENT DIRECTIONS RATHER THAN MARKET NEEDS.

MUCH MORE CAN BE SAID ABOUT SOVIET RESEARCH; HOWEVER, IT IS CLEAR FROM THE HIGHLIGHTS THAT THE SOVIET UNION HAS MUCH TO OFFER IN COOPERATIVE PROGRAMS. HENCE, BENEFITS FROM EXPANDED COOPERATION CAN BE VERY GREAT INDEED, FOR BOTH SIDES.

#### TYPES OF COOPERATION

ALTHOUGH NOT WIDELY KNOWN, THERE HAS BEEN SIGNIFICANT COOPERATION IN SCIENCE BETWEEN THE UNITED STATES AND THE SOVIET UNION FOR MORE THAN 30 YEARS.

SCIENTIFIC EXCHANGES: FOR THE MOST PART, THIS COOPERATION HAS TAKEN THE FORM OF SCIENTIFIC AND TECHNOLOGICAL

EXCHANGES BETWEEN SOVIET AND U.S. SCIENTISTS. IN SOME CASES, U.S. SCIENTISTS ARE ASSIGNED TO SOVIET LABORATORIES AND VICE VERSA. FURTHER, THE EXCHANGES USUALLY HAVE BEEN LIMITED TO SCIENTISTS FROM GOVERNMENT AGENCIES AND UNIVERSITIES WITHOUT PARTICIPATION BY INDUSTRY TECHNICAL PERSONNEL.

THE LEVEL OF EXCHANGES WAS SHARPLY REDUCED AFTER U.S.-SOVIET RELATIONSHIPS SOURED WITH THE RUSSIAN INVASION OF AFGHANISTAN IN 1979. HOWEVER, BY 1985, THE LEVEL OF EXCHANGE ACTIVITY STARTED TO REBUILD AS THE RESULT OF AN INITIATIVE BY THE U.S. NATIONAL ACADEMY OF SCIENCE TO GET A NEW SCIENTIFIC AND TECHNOLOGICAL EXCHANGE AGREEMENT SIGNED WITH ITS COUNTERPART, THE SOVIET ACADEMY OF SCIENCE. FURTHER IMPETUS FOR INCREASED ACTIVITY IS BEING PROVIDED BY AN AGREEMENT BEING NEGOTIATED BETWEEN THE U.S. AND SOVIET GOVERNMENTS TO BROADEN SOVIET-AMERICAN TECHNOLOGICAL COOPERATION IN THE BASIC SCIENCES.

IN SPITE OF THE SETBACK IN COOPERATION DURING 1979 AND THE EARLY 1980's, THE ACHIEVEMENTS THROUGH U.S.-SOVIET TECHNICAL EXCHANGE PROJECTS HAVE BEEN SIGNIFICANT, ALTHOUGH FAR FROM THE FULL POTENTIAL FOR TECHNOLOGICAL COOPERATION BETWEEN OUR TWO NATIONS.

SINCE THERE IS NO DIRECT WAY TO ASSESS RESULTS OF THE SCIENTIFIC AND TECHNICAL EXCHANGES, OTHER METHODS HAVE TO BE USED, SUCH AS EVALUATIONS BY STUDY GROUPS AND STATEMENTS BY PARTICIPANTS. I WON'T TAKE TIME TO ELABORATE ON EVALUATION OF RESULTS, EXCEPT TO MENTION THAT DR. VICTOR RABINOWITZ, OF THE NATIONAL ACADEMY OF SCIENCE, RECENTLY NOTED THAT THERE HAVE BEEN MORE THAN 25 EVALUATIONS OF VARIOUS ASPECTS OF U.S.-SOVIET SCIENTIFIC EXCHANGES IN THE PAST DECADE. THESE EVALUATIONS CONCLUDED THAT CAREFULLY MANAGED EXCHANGES WITH THE SOVIET UNION CAN BRING SUBSTANTIAL BENEFITS TO THE UNITED STATES.

JOINT VENTURES: ANOTHER TYPE OF INTERNATIONAL COOPERATION BETWEEN THE U.S. AND THE SOVIET UNION WHICH IS NOW AVAILABLE IS THE JOINT VENTURE. UNTIL JANUARY 1987, WHEN SOVIET LAW WAS CHANGED, JOINT VENTURES WERE NOT ALLOWED. HOWEVER, NOT ONLY ARE THEY NOW LEGAL, BUT THEIR FORMATION IS BEING ACTIVELY ENCOURAGED BY THE SOVIET GOVERNMENT.

A JOINT VENTURE IS NORMALLY ESTABLISHED BY TWO PARTICIPATING COMPANIES WHICH ESTABLISH A THIRD ONE. EACH FOUNDING PARTY HAS EQUAL OR NEARLY EQUAL OWNERSHIP. JOINT VENTURES ARE USUALLY FORMED BETWEEN TWO COMPANIES; HOWEVER, A SIGNIFICANT NUMBER HAVE BEEN SET UP BETWEEN A CORPORATION AND A STATE OR NATIONAL GOVERNMENT. IN FACT, THE GREATEST

POTENTIAL IN THE LONG RUN FOR COOPERATION BETWEEN THE UNITED STATES AND THE SOVIET UNION IS JOINT VENTURES BETWEEN U.S. SMALL COMPANIES AND SOVIET ORGANIZATIONS. I SHOULD ADD, PARENTHETICALLY, THAT THIS IS ALSO TRUE FOR INTERNATIONAL COOPERATION BETWEEN THE U.S. AND OTHER COUNTRIES.

JOINT VENTURES INVOLVING SMALL ENTERPRISES ARE AN ESPECIALLY ATTRACTIVE MEANS OF DEVELOPING OR TRANSFERRING TECHNOLOGY. THERE ARE SEVERAL REASONS FOR THIS. FIRST, IF PROPERLY STRUCTURED, BOTH PARTIES ARE REASONABLY ASSURED OF EQUITABLE COMPENSATION FOR THE TECHNOLOGY MADE AVAILABLE TO THE JOINT VENTURE. SECOND, SUCH ARRANGEMENTS SPREAD THE RISK OVER AT LEAST TWO MARKETS AND TWO FIRMS. THIRD, SINCE THE PARTNER'S RETURNS ARE ACHIEVED THROUGH THE SUCCESS OF THE JOINT VENTURE, IT IS THE MARKETPLACE WHICH TRULY DETERMINES THE VALUE OF THE TECHNOLOGY INVOLVED -- JUST AS IT SHOULD BE. FOURTH, A JOINT VENTURE PROVIDES BOTH FIRMS WITH A MEANS OF DIRECT AND ENDURING PARTICIPATION IN ONE (OR MORE) FOREIGN MARKETS AS REFLECTED IN THE PROFITS EARNED AND IN CONTINUING KNOWLEDGE OF THE REQUIREMENTS OF SUCH MARKETS. SUCH EXPERIENCE WILL, IN TURN, GUIDE APPROPRIATE CHANGES AND IMPROVEMENTS IN THE TECHNOLOGY AT THE HEART OF THE JOINT VENTURE'S OUTPUT.

FINALLY, SUCH JOINT VENTURES ARE BENEFICIAL TO THE COUNTRIES INVOLVED BECAUSE JOBS ARE SHARED; WHEREAS, IN A TRANSFER OF TECHNOLOGY FOR A LICENSE FEE, WHICH IS QUITE COMMON, THE JOBS CREATED ARE ALL IN ONE COUNTRY.

A RELATED FACTOR FAVORING INTERNATIONAL COOPERATION IN TECHNOLOGY BY SMALL BUSINESS PARTICIPATION IN JOINT VENTURES, IS THE CHANGING SCALE IN MANUFACTURING JUST AROUND THE CORNER. THROUGH THE USE OF COMPUTER-AIDED DESIGN, COMPUTER-INTEGRATED MANUFACTURING AND FLEXIBLE AUTOMATED FABRICATION AND ASSEMBLY, FACTORIES WILL BECOME SMALLER AND BE ABLE TO PRODUCE PRODUCTS AT LOW COST, HIGH QUALITY, IN SMALL QUANTITIES AND IN SHORT TIME PERIODS. THE ADVENT OF THIS TYPE OF FACTORY WILL MAKE IT POSSIBLE TO PRODUCE LOCALLY MOST PRODUCTS. THIS WILL LEAD TO MUCH LESS IMPORTING AND EXPORTING. SMALLER COMPANIES, BECAUSE OF THEIR GREATER INNOVATIVE CAPABILITIES, ARE SUITED TO THIS MOVEMENT.

HOWEVER, THEY WILL NEED ASSISTANCE IF THEY ARE TO AGGRESSIVELY LEAD IT, BECAUSE FOREIGN JOINT VENTURES INVOLVING SMALL COMPANIES ARE NOT COMMON TODAY. THE REASONS ARE LACK OF EXPERTISE AND RESOURCES BY MOST SMALL COMPANIES TO ESTABLISH A JOINT VENTURE WITH A FOREIGN ORGANIZATION. HOWEVER, THAT HURDLE CAN BE CIRCUMVENTED

WITH ASSISTANCE BY A NEW COMMUNITY-BASED ORGANIZATION CALLED AN INNOVATION NETWORK. BEFORE DESCRIBING THE NETWORK AND HOW IT FUNCTIONS, I SHOULD DISCUSS THE MAJOR NEEDS TO BE MET -- AND THE CONCURRENT OPPORTUNITIES TO BE REALIZED -- BY A PROGRAM OF JOINT VENTURES BETWEEN U.S. SMALL COMPANIES AND SOVIET ORGANIZATIONS BASED ON SOVIET TECHNOLOGY.

### MAJOR NEEDS

SOVIET: ON THE SOVIET SIDE, THERE IS A MAJOR AND BASIC NEED FOR ENTREPRENEURIAL ORGANIZATIONS IN ORDER TO MEET ONE OF THE OVERRIDING OBJECTIVES OF PERESTROIKA, NAMELY THE ESTABLISHMENT OF IMPORTANT SOVIET PRODUCT LEADERSHIP POSITIONS IN WORLD MARKETS. CURRENTLY, SOVIET INDUSTRY CONSISTS MAINLY OF HUGE GOVERNMENT CONTROLLED ORGANIZATIONS WHICH HAVE A RECORD OF INEFFICIENTLY PRODUCING OUTDATED AND POOR QUALITY ARTICLES.

THERE ARE A NUMBER OF REASONS FOR THE DISMAL RECORD; ONE OF THE MOST IMPORTANT IS THAT LARGE ORGANIZATIONS STIFLE CREATIVITY WHETHER LOCATED IN RUSSIA OR AMERICA. HISTORY SHOWS THAT MANY OF THE MOST IMPORTANT TECHNICAL ADVANCES DIDN'T ORIGINATE IN LARGE COMPANIES, BUT CAME FROM SMALL ENTERPRISE. IBM DIDN'T PIONEER THE ELECTRONIC COMPUTER. THIS WAS DONE BY TWO SMALL COMPANIES, ECKERT-MAUCHLY AND

ENGINEERING RESEARCH ASSOCIATES. INSTANT PHOTOGRAPHY WAS INVENTED BY A SMALL STARTUP COMPANY, POLAROID, NOT EASTMAN KODAK, AND SO ON.

THEREFORE, THE MOST PRODUCTIVE ROUTE THE SOVIET UNION CAN FOLLOW TO ACHIEVE IMPORTANT PRODUCT LEADERSHIP POSITIONS IS BY ESTABLISHING A LARGE NUMBER OF SMALL ENTERPRISE JOINT VENTURES BETWEEN SOVIET ORGANIZATIONS AND SMALL U.S. BUSINESSES BASED ON SOVIET TECHNOLOGY.

U.S.: ON THE UNITED STATES SIDE, THE SMALL BUSINESS SECTOR HAS MAJOR NEEDS FOR NEW MARKETS AND NEW TECHNOLOGIES. EVEN THOUGH THIS SECTOR IS THE SOURCE OF MANY OF THE MOST IMPORTANT INNOVATIONS, EMPLOYS ABOUT HALF THE WORKFORCE AND, OVER THE PAST TEN YEARS, HAS CREATED A HIGH PERCENTAGE OF THE NEW JOBS, MOST SMALL BUSINESSES HUNGER FOR NEW TECHNOLOGIES AND NEW MARKETS. GIVEN PARTICIPATION IN JOINT VENTURES WHEREBY A LARGE NUMBER OF SMALL U.S. BUSINESSES COULD ACCESS THE HUGE STOREHOUSE OF SOVIET TECHNOLOGY, A SIGNIFICANT, AND MUCH NEEDED, SURGE IN INNOVATION WOULD OCCUR. FAR-REACHING BENEFITS WOULD RESULT INCLUDING INCREASED U.S. COMPETITIVENESS AND A LARGE NUMBER OF BETTER-PAYING JOBS.

## PLAN

REALIZATION OF THE POTENTIAL BENEFITS OF SMALL ENTERPRISE

JOINT VENTURES WILL NOT OCCUR WITHOUT A PROPERLY STRUCTURED PROGRAM FOR ESTABLISHING THEM. SUCH A PROGRAM WAS PROPOSED EARLIER THIS YEAR TO THE SOVIET UNION BY THE WILLIAM C. NORRIS INSTITUTE. IT WOULD BE IMPLEMENTED BY, GUESS WHAT -- A JOINT VENTURE BETWEEN THE NORRIS INSTITUTE AND A SOVIET ORGANIZATION. THE NEW ORGANIZATION, CREATED BY THE JOINT VENTURE, WOULD BE CALLED THE ENTREPRENEURIAL INSTITUTE.

THIS INSTITUTE WILL FOCUS ON TWO MAIN ACTIVITIES, ENTREPRENEURIAL MANAGEMENT TRAINING AND THE FORMATION OF SMALL ENTERPRISE JOINT VENTURES.

ENTREPRENEURIAL MANAGEMENT TRAINING: THE HALLMARK OF ENTREPRENEURIAL MANAGEMENT IS THE ABILITY TO RAPIDLY COMMERCIALIZE LABORATORY RESEARCH OUTCOMES INTO PRODUCTS THAT ARE COMPETITIVE IN A GLOBAL ECONOMY. SKILLS REQUIRED INCLUDE THOSE FOR IDENTIFYING MARKET NEEDS, SIMULTANEOUS ENGINEERING, DESIGN AND MANUFACTURE OF PRODUCTS OF HIGHEST QUALITY, LOWEST COST, IN SHORTEST POSSIBLE TIME, AND THE ABILITY TO SELL THEM IN WORLD MARKETS.

THESE SKILLS ARE BEST ACQUIRED AND HONED BY COMBINING TEACHING WITH ON-THE-JOB EXPERIENCE. I.E., ENTREPRENEURIAL EDUCATION AND TRAINING IS LINKED CLOSELY WITH THE START UP AND OPERATION OF CREATIVE ENTERPRISES.

THEREFORE, THE ENTREPRENEURIAL MANAGEMENT TRAINING PROVIDED BY THE ENTREPRENEURIAL INSTITUTE WILL BE COUPLED WITH THE THE SECOND ACTIVITY, THE FORMATION OF SMALL ENTERPRISE JOINT VENTURES.

KEY TO THE SUCCESS OF THE TRAINING PROGRAM IS THE UTILIZATION OF COMPUTER TECHNOLOGY AS THE PRIMARY MODE OF DELIVERY OF THE EDUCATION AND TRAINING. IN THIS MODE, THE COMPUTER DISSEMINATES HIGHEST QUALITY INFORMATION AND KNOWLEDGE, SERVES AS A LABORATORY DEVICE, MANAGES INSTRUCTION, CONDUCTS TESTS AND GENERATES REPORTS. AT THE SAME TIME, LEARNING PROGRAMS ARE DESIGNED TO MEET THE NEEDS OF EACH STUDENT. TEACHERS ALSO ARE FREED OF INEFFICIENT TRADITIONAL LECTURING, TESTING AND RECORD KEEPING; HENCE, THEY HAVE MORE TIME FOR NURTURING INDIVIDUAL STUDENTS.

FURTHER, IT IS NEITHER FEASIBLE NOR AFFORDABLE TO UTILIZE TRADITIONAL INSTRUCTOR-BASED TEACHING METHODS. NOT ENOUGH QUALIFIED RUSSIAN SPEAKING U.S. INSTRUCTORS ARE AVAILABLE, AND IT WOULD BE TIME CONSUMING AND COSTLY TO PROVIDE LANGUAGE TRAINING TO U.S. INSTRUCTORS. FURTHER, BECAUSE OF LACK OF AN ENTREPRENEURIAL CULTURE IN THE SOVIET UNION, IT ISN'T FEASIBLE AT PRESENT TO TRAIN SOVIET PERSONNEL TO PROVIDE THE INSTRUCTION.

WHAT IS FEASIBLE AND AFFORDABLE IS TO START THE INSTITUTE WITH A SMALL NUMBER OF U.S. INSTRUCTORS AND MOVE RAPIDLY WITH THE DEVELOPMENT OF COMPUTER-BASED COURSEWARE (LESSON MATERIAL), BASED ON U.S. COURSES WHICH ARE CONVERTED TO THE RUSSIAN LANGUAGE BY SOVIET PERSONNEL EMPLOYED BY THE ENTREPRENEURIAL INSTITUTE.

SMALL ENTERPRISE J-V'S: CONCURRENTLY, WITH THE ESTABLISHMENT OF ENTREPRENEURIAL MANAGEMENT TRAINING ACTION, THE PROCESS WILL COMMENCE FOR ESTABLISHING JOINT VENTURES BETWEEN U.S. SMALL COMPANIES AND SOVIET ORGANIZATIONS BASED ON SOVIET TECHNOLOGY. THE INITIAL STEP IS, OF COURSE, TO IDENTIFY POTENTIAL TECHNOLOGY ON WHICH TO BASE JOINT VENTURES.

THE TENTATIVE SELECTION OF PROMISING RESEARCH OUTCOMES WOULD BE MADE BY A GROUP OF U.S. SMALL BUSINESS REPRESENTATIVES VISITING THE SOVIET UNION. THEY WOULD DISCUSS, ON A FIRST-HAND BASIS, VARIOUS RESEARCH RESULTS WHICH, WITH FURTHER PROPERLY-ORIENTED APPLIED RESEARCH, WOULD RESULT IN TECHNOLOGIES WITH COMMERCIAL POTENTIAL. ALSO, EXISTING TECHNOLOGIES WOULD BE EXAMINED FOR COMMERCIAL POTENTIAL OR WHICH WOULD HAVE COMMERCIAL POTENTIAL WITH ADDITIONAL APPLIED RESEARCH. HOWEVER, THE MAJOR THRUST OF THE EFFORT TAKES PLACE PRIOR TO THE

EXISTENCE OF TECHNOLOGY. EVEN WHEN A PROMISING RESEARCH PROJECT HAS BEEN IDENTIFIED BY A U.S. SMALL BUSINESS AND A SOVIET LABORATORY, THE PROJECT WILL NORMALLY HAVE TO PROCEED FOR A TIME BEFORE IT IS KNOWN WHETHER OR NOT IT HAS THE POTENTIAL FOR A JOINT VENTURE.

FUNDING FOR INITIAL VISITS OF U.S. SMALL COMPANY REPRESENTATIVES TO THE SOVIET UNION WOULD BE PROVIDED BY SOURCES IN THE UNITED STATES. AFTER A PROMISING RESEARCH OUTCOME OR A TECHNOLOGY IS IDENTIFIED, A JOINT VENTURE COMPANY FOR COMMERCIALIZING THE TECHNOLOGY WOULD BE FORMED WITH OPERATIONS IN BOTH THE SOVIET UNION AND IN THE U.S. AFTER THE FORMATION OF THE JOINT VENTURES, ALL TRAVEL AND LIAISON COSTS WOULD BE BORNE BY IT.

ONCE DIRECT CONTACT HAS BEEN ESTABLISHED BETWEEN REPRESENTATIVES OF THE U.S. SMALL COMPANY AND THE SOVIET LABORATORY, IT IS PROPOSED THAT THEY COMMUNICATE ON A REGULAR BASIS VIA A NETWORK OF PERSONAL COMPUTERS. IN THIS WAY, A CONTINUING DIALOGUE CAN OCCUR WITHOUT THE NEED FOR FREQUENT SITE VISITS.

STATUS: AT THIS POINT, YOU MAY BE WONDERING ABOUT SOVIET REACTION TO THE PROPOSAL. IN A FEW WORDS, I CAN TELL YOU THERE IS STRONG INTEREST ON THE PART OF MAJOR COGNIZANT

SOVIET ORGANIZATIONS, AND I EXPECT TO SIGN A LETTER OF INTENT TO NEGOTIATE A DEFINITIVE CONTRACT FOR IMPLEMENTATION WHEN I RETURN TO MOSCOW NEXT MONTH.

SUPPORT

ACHIEVING THE GOAL OF ESTABLISHING A LARGE NUMBER OF U.S.-SOVIET SMALL ENTERPRISE JOINT VENTURES, AS NOTED EARLIER, WILL REQUIRE A TYPE OF SUPPORT STRUCTURE HERE IN THE UNITED STATES WHICH DOES NOT PRESENTLY EXIST.

SMALL BUSINESS INNOVATION NETWORK: FORTUNATELY, HOWEVER, MANY OF ITS FUNCTIONS ARE BEING PERFORMED BY EXISTING ORGANIZATIONS, WHICH CAN BE ARRANGED IN THE TYPE OF SUPPORT STRUCTURE NEEDED, CALLED AN INNOVATION NETWORK. IT CONSISTS OF THREE PARTS: A COOPERATION OFFICE, A SEED CAPITAL FUND AND A BUSINESS CENTER. AN INNOVATION NETWORK PERFORMS A NUMBER OF FUNCTIONS, INCLUDING ASSISTANCE TO SMALL BUSINESSES IN STARTING UP AND BECOMING SUCCESSFUL AND HELPING TO SET UP JOINT VENTURES BETWEEN SMALL U.S. COMPANIES AND OVERSEAS ORGANIZATIONS.

SMALL BUSINESS ASSISTANCE: LET ME FIRST REVIEW HOW AN INNOVATION NETWORK FUNCTIONS IN HELPING SMALL BUSINESSES START UP.

COOPERATION OFFICE: THE PIVOTAL ELEMENT IN THE NETWORK IS THE COOPERATION OFFICE. IT IS A NON-PROFIT CORPORATION UNDER THE CONTROL OF THE COMMUNITY. THIS IS PREFERABLE TO BEING PART OF A COLLEGE OR UNDER THE AEGIS OF A STATE, COUNTY OR CITY GOVERNMENT. OTHERWISE, THE COMMUNITY WILL NOT HAVE THE RESPONSIBILITY FOR FOSTERING COOPERATION TO EXPAND INNOVATION. WITHOUT THE RESPONSIBILITY, THERE WILL BE LESS CONCERN ABOUT PROGRESS, LESS INTEREST IN ADVANCING KNOWLEDGE ABOUT THE PROCESS OF INNOVATION AND, OF COURSE, IN THE LONG RUN, LESS INNOVATION.

THE COOPERATION OFFICE IS FINANCED BY STATE AND LOCAL GOVERNMENT, PRIVATE CONTRIBUTIONS, CLIENT FEES AND FUNDS GENERATED BY INVESTMENTS IN CLIENT COMPANIES. A COOPERATION OFFICE'S BOARD OF DIRECTORS CONSISTS OF LOCAL LEADERS FROM MAJOR SECTORS OF SOCIETY. THE PERMANENT STAFF IS SMALL, BUT THE COOPERATION OFFICE DRAWS ON A VOLUNTEER ADVISORY PANEL OF SCIENTISTS, ENGINEERS, MARKETING SPECIALISTS AND EXECUTIVES FOR THE SPECIFIC EXPERTISE REQUIRED TO ASSIST AN ENTREPRENEUR WHO WANTS TO START A COMPANY PREPARE A BUSINESS PLAN.

SEED CAPITAL: EQUITY FINANCING IS OFTEN NOT AVAILABLE FOR NEW COMPANIES DURING THEIR INITIAL FORMATION AND EARLY DEVELOPMENT STAGES FROM BANKS, VENTURE CAPITAL FUNDS AND

OTHER CONVENTIONAL SOURCES, BECAUSE OF THE HIGHER RISKS INVOLVED. THEREFORE, A SOURCE OF SEED CAPITAL IS NEEDED. A SEED FUND, IN CONTRAST TO THE COOPERATION OFFICE, SHOULD BE A FOR-PROFIT OPERATION IN ORDER TO BE OPERATED MOST EFFECTIVELY AND ATTRACT NEEDED CAPITAL. EXPERIENCE SHOWS THAT THE MINIMUM INITIAL CAPITALIZATION FOR A SUCCESSFUL SEED CAPITAL FUND IS \$5 MILLION.

BUSINESS CENTER: A BUSINESS CENTER, WHICH IS ALSO A FOR-PROFIT CORPORATION, PROVIDES VARIOUS COMBINATIONS OF CONSULTING SERVICES, SHARED LABORATORY, MANUFACTURING AND OFFICE FACILITIES AND OTHER SERVICES TO FACILITATE THE START UP AND GROWTH OF SMALL BUSINESSES. ECONOMIES OF SCALE MAKE IT POSSIBLE TO PROVIDE OCCUPANTS OF THE CENTER AND SMALL COMPANIES NEARBY, WITH NEEDED FACILITIES OF MUCH HIGHER QUALITY AND CONSIDERABLY LOWER COST THAN ANY WOULD BE CAPABLE OF OBTAINING OR PROVIDING BY ITSELF.

JOINT VENTURES: HAVING DESCRIBED HOW THE INNOVATION NETWORK HELPS SMALL BUSINESSES TO START UP, LET ME NOW COMMENT ON A SECOND MAJOR FUNCTION, WHICH IS HELPING TO ESTABLISH JOINT VENTURES BETWEEN SMALL U.S. COMPANIES AND OVERSEAS ORGANIZATIONS.

ASSISTANCE MUST BE PROVIDED, WHICH IS QUITE SIMILAR TO HELPING A SMALL COMPANY START UP; BECAUSE, IN FACT, IT IS A

NEW COMPANY. SMALL U.S. COMPANIES WOULD INCUR PROHIBITIVE COSTS IN LEARNING HOW TO ESTABLISH AND OPERATE OVERSEAS JOINT VENTURES. HENCE, AN EXISTING ORGANIZATION LIKE A COOPERATION OFFICE IS REQUIRED FOR ASSISTANCE, ESPECIALLY IN ESTABLISHING JOINT VENTURES WITH SOVIET ORGANIZATIONS. SINCE SUCH JV'S WERE AUTHORIZED LESS THAN TWO YEARS AGO, THERE IS LITTLE EXPERIENCE TO TAP.

FRACTIONATION: YET, AS NOTED EARLIER, COMMUNITIES IN THE U.S. CURRENTLY LACK THE SUPPORT STRUCTURE FOR ADEQUATELY ASSISTING SMALL BUSINESSES IN ESTABLISHING JOINT VENTURES OVERSEAS. A MAJOR REASON IS FRACTIONATION OF COMMUNITY ECONOMIC DEVELOPMENT ACTIVITIES. FRACTIONATION IS MANIFESTED BY THE PROLIFERATION OF ORGANIZATIONS IN COMMUNITIES CONCERNED WITH ONE OR MORE ASPECTS OF ECONOMIC DEVELOPMENT, E.G., COUNTY ECONOMIC DEVELOPMENT CORPORATIONS, CITY ECONOMIC DEVELOPMENT CORPORATIONS, CHAMBERS OF COMMERCE, COUNTY EXTENSION OFFICES, SMALL BUSINESS DEVELOPMENT CENTERS, ETC. EACH ORGANIZATION IS DOING SOME GOOD BUT FALLING FAR SHORT OF WHAT NEEDS TO BE DONE BECAUSE OF LACK OF RESOURCES. THROUGH COOPERATION AND/OR CONSOLIDATION, GREATER RESOURCES WOULD BE AVAILABLE. UNTIL THIS IS ACCOMPLISHED, ASSISTANCE FOR SMALL BUSINESS STARTUPS AND THE ESTABLISHMENT OF JOINT VENTURES WITH OVERSEAS ORGANIZATIONS WILL BE FAR SHORT OF

WHAT IS REQUIRED. THOSE COMMUNITIES WHICH ACT PROMPTLY TO PROVIDE THE DEGREE OF SUPPORT NEEDED WILL BE REWARDED WITH EXPANDED ECONOMIC ACTIVITY AND JOB GROWTH.

### EXPERIENCE

THERE IS NO DOUBT IN MY MIND, BECAUSE OF PAST EXPERIENCE, THAT, WITH ADEQUATE SUPPORT, A LARGE NUMBER OF SUCCESSFUL SMALL ENTERPRISE JOINT VENTURES WITH THE SOVIET UNION CAN BE ESTABLISHED. LET ME CITE TWO SPECIFIC CASES WHICH ARE PART OF MY CONFIDENCE BASE, WHICH WAS BUILT UP DURING MY TENURE AS CHIEF EXECUTIVE OFFICER OF CONTROL DATA FROM RELATIONSHIPS WITH THE SOVIET UNION AND OTHER SOCIALIST COUNTRIES.

CONTROL DATA MADE A MAJOR COMMITMENT TO DEVELOP TECHNOLOGICAL COOPERATION WITH THE SOVIET BLOC IN RESPONSE TO ENCOURAGEMENT BY PRESIDENT NIXON. IN 1969, I ATTENDED A MEETING AT THE WHITE HOUSE AT WHICH HE DESCRIBED THE POTENTIAL BENEFITS FOR BOTH SIDES OF EXPANDED TECHNOLOGICAL COOPERATION WITH THE SOVIET BLOC. FURTHER SUMMIT LEVEL ENCOURAGEMENT WAS PROVIDED BY THE GENERAL AGREEMENT ON SCIENTIFIC AND TECHNOLOGICAL COOPERATION SIGNED DURING THE NIXON-BREZHNEV MEETING IN MOSCOW IN MAY OF 1972. THEN IN JUNE 1973, THERE WAS A SECOND NIXON-BREZHNEV MEETING AT THE WHITE HOUSE WHICH I ALSO ATTENDED.

THE ONLY SIGNIFICANT PROJECT WHICH CONTROL DATA WAS ABLE TO GET UNDERWAY WITH THE SOVIET UNION BEFORE THE RELATIONSHIP BETWEEN THE U.S. AND THE SOVIET UNION DETERIORATED WAS ONE RELATED TO THE USE OF TITANIUM NITRIDE TO COAT METAL CUTTING TOOLS TO INCREASE THEIR PERFORMANCE AND LIFE. A SOVIET LABORATORY HAD DEVELOPED A COATING PROCESS WHICH DEMONSTRATED FEASIBILITY; HOWEVER, FURTHER DEVELOPMENT WAS REQUIRED BEFORE IT COULD BE MARKETED. A JOINT VENTURE WAS PROPOSED TO THE SOVIET UNION AS THE FAIR WAY TO PROCEED TO THE NEXT STAGE. HOWEVER, AT THAT TIME, JOINT VENTURES WITH THE WEST WERE NOT ALLOWED BY SOVIET LAW. THEREFORE, A LICENSE TO USE THE TECHNOLOGY WAS OFFERED FOR \$400,000. A SMALL COMPANY, MULTIARC VACUUM SYSTEMS, WAS ESTABLISHED IN THE U.S. TO LICENSE THE TECHNOLOGIES AND UNDERTAKE THE NECESSARY DEVELOPMENT. CONTROL DATA TOOK A 20 PERCENT INTEREST IN THE COMPANY. TO MAKE A LONG STORY SHORT, THE COMPANY WAS VERY SUCCESSFUL. IN FACT, CONTROL DATA SOLD ITS INTEREST, TWO YEARS AGO, AT A PROFIT OF \$8 MILLION.

MULTIARC'S SUCCESS ILLUSTRATES THE ADVANTAGES OF A COOPERATIVE VENTURE OVER LICENSING TECHNOLOGY. WHILE IT WASN'T POSSIBLE DURING THE LATE SEVENTIES TO CONSIDER THE ALTERNATIVE OF A COOPERATIVE VENTURE, THE SOVIET UNION WOULD OBVIOUSLY HAVE REALIZED A MUCH GREATER FINANCIAL GAIN

FROM BEING A PARTNER IN SUCH AN APPROACH. IN ADDITION, CONTINUING COOPERATION WOULD HAVE BEEN LIKELY BETWEEN THE SOVIET RESEARCHERS IN THAT FIELD AND MULTIARC WHICH WOULD HAVE CREATED TECHNOLOGY FOR IMPROVEMENTS AND NEW PRODUCTS.

THE SECOND EXPERIENCE TO CITE IS THE JOINT VENTURE BETWEEN CONTROL DATA AND ROMANIA, CALLED ROM-CDC, WHICH WAS ESTABLISHED IN 1973 TO MANUFACTURE COMPUTER PERIPHERAL EQUIPMENT BASED ON CONTROL DATA TECHNOLOGY. CONTROL DATA OWNS 45 PERCENT OF THE COMPANY, AND THE GOVERNMENT OF ROMANIA HOLDS THE REMAINING 55 PERCENT. WHILE THERE HAVE BEEN NUMEROUS PROBLEMS, THE WORST BEING U.S. EXPORT CONTROLS, ROM-CDC HAS DEVELOPED INTO A PROFITABLE COMPANY WHICH HAS BEEN PAYING ANNUAL DIVIDENDS. FURTHER, THE INITIAL CASH INVESTMENT BY CONTROL DATA HAS BEEN REPAID. ALSO IMPORTANT TO NOTE IS THAT ROM-CDC HAS BUILT UP A COMPETENT ENGINEERING STAFF TO PERFORM PRODUCT DEVELOPMENT AND IS NO LONGER COMPLETELY DEPENDENT ON IMPORTED TECHNOLOGY.

ONE OTHER PART OF MY CONFIDENCE BASE TO MENTION IS THAT I HAVE LEARNED THAT PEOPLE IN SOCIALIST COUNTRIES ARE RELIABLE PARTNERS. THEY NEGOTIATE LONG AND HARD BEFORE MAKING A CONTRACT COMMITMENT. HOWEVER, ONCE THAT IS DONE, THEY INVARIABLY ARE CAREFUL TO LIVE UP TO THE TERMS OF THE

AGREEMENT AND ARE REASONABLE IN THE RESOLUTION OF UNFORESEEN PROBLEMS.

OTHER OPPORTUNITIES FOR COOPERATION

J-V'S BASED ON U.S. TECHNOLOGY: HAVING DWELLED ON SMALL ENTERPRISE JOINT VENTURES BASED ON SOVIET TECHNOLOGY, I WANT TO COMMENT NEXT ON THE POTENTIAL FOR JOINT VENTURES BASED ON U.S. TECHNOLOGY. OF COURSE, THERE ARE MANY SUCH OPPORTUNITIES FOR BOTH LARGE AND SMALL COMPANIES; HOWEVER, THERE IS ALSO STIFF COMPETITION FROM OTHER COUNTRIES. UNLESS THERE IS A DISTINCT ADVANTAGE, SUCH AS A UNIQUE AND IMPORTANT FEATURE, COMPANIES IN OTHER COUNTRIES WILL USUALLY BE FAVORED FOR JOINT VENTURES OVER U.S. COMPANIES. THIS STEMS FROM U.S. POLICIES TO USE TRADE SANCTIONS TO ACHIEVE FOREIGN POLICY AND NATIONAL SECURITY OBJECTIVES. AS A CONSEQUENCE, U.S. COMPANIES ARE OFTEN VIEWED AS POTENTIALLY UNRELIABLE PARTNERS IN A JOINT VENTURE BECAUSE OF THE POSSIBILITY OF BEING CONSTRAINED AT SOME POINT BY UNPREDICTABLE U.S. GOVERNMENT INTERVENTION. ON EACH OCCASION THAT I VISIT THE SOVIET UNION, THAT CONCERN IS MENTIONED; AND BECAUSE OF IT, COMPANIES IN A NUMBER OF OTHER COUNTRIES, PARTICULARLY IN WEST GERMANY, JAPAN, ITALY AND SWEDEN ARE IN A MORE ADVANTAGEOUS POSITION WITH RESPECT TO JOINT VENTURES.

HAVING THIS HANDICAP IS NOT A REASON FOR INACTION IF A COMPANY, LARGE OR SMALL, HAS A SUPERIOR PRODUCT -- BY ALL MEANS, LOOK INTO A JOINT VENTURE WITH A SOVIET ORGANIZATION. OF COURSE, FOR A SMALL COMPANY, ASSISTANCE SUCH AS THAT PROVIDED BY AN INNOVATION NETWORK IS VERY IMPORTANT.

THE BEST POTENTIAL AREAS FOR SOVIET JOINT VENTURES INCLUDE: FOOD PROCESSING, HEALTH CARE AND EDUCATION AND TRAINING. ALSO, THE SOVIET UNION IS GREATLY INTERESTED IN JOINT VENTURES IN LEADING EDGE, HIGH TECHNOLOGIES IN COMPUTERS, TELECOMMUNICATIONS EQUIPMENT, INSTRUMENTATION AND BIOTECHNOLOGY. HOWEVER, THESE TECHNOLOGIES ARE ON THE U.S. EXPORT CONTROL LIST AND EXPORT LICENSES WOULD NOT LIKELY BE AVAILABLE. HOPEFULLY, EXPORT CONTROLS ON HIGH TECHNOLOGY WILL BE GREATLY RELAXED AS RELATIONSHIPS WITH THE SOVIET UNION IMPROVE.

INDUSTRY-UNIVERSITY-GOVERNMENT COOPERATION: BEFORE CONCLUDING, I WANT TO COMMENT FURTHER ON THE BROADENED U.S.-SOVIET AGREEMENT FOR COOPERATION IN THE BASIC SCIENCES, WHICH I ALLUDED TO EARLIER, BECAUSE IT CAN BE ANOTHER SOURCE OF MAJOR BENEFITS TO BOTH COUNTRIES. THE INITIAL DRAFT OF THE AGREEMENT PROVIDED THAT SCIENTISTS FROM INDUSTRY WOULD PARTICIPATE, AS WELL AS THOSE FROM

UNIVERSITIES AND GOVERNMENT, IN COOPERATIVE SCIENCE PROJECTS. THERE WAS OPPOSITION BY THE U.S. DEPARTMENT OF DEFENSE TO PARTICIPATION BY INDUSTRY SCIENTISTS, BECAUSE OF CONCERN OVER INCREASING THE RISK THAT THE SOVIETS WOULD GAIN ACCESS TO HIGH TECHNOLOGY APPLICABLE TO MILITARY USE. AS A RESULT, THE AGREEMENT IS BEING REDRAFTED. THUS, IT IS CLEAR THE SUPPORT POTENTIAL FOR U.S.-SOVIET COOPERATION, INVOLVING INDUSTRY, UNIVERSITIES AND GOVERNMENT, WON'T BE REALIZED UNTIL EXPORT CONTROLS ON HIGH TECHNOLOGY ARE SIGNIFICANTLY RELAXED. MEANWHILE, OTHER COUNTRIES WILL BE ESTABLISHING SUCH PROGRAMS. THIS REALITY IS FURTHER EVIDENCE THAT SMALL ENTERPRISE JOINT VENTURES ARE CURRENTLY THE BEST ROUTE FOR THE U.S. TO GAIN THE ECONOMIC BENEFITS FROM EXPANDED TECHNOLOGICAL COOPERATION WITH THE SOVIET UNION.

### CONCLUSION

NOT ONLY IS THE SMALL ENTERPRISE JOINT VENTURE, BASED ON SOVIET TECHNOLOGY, THE BEST WAY TO EXPAND TECHNOLOGICAL COOPERATION, IT IS ALSO THE BEST WAY, IN THE LONG RUN, TO INCREASE THE VOLUME OF TRADE BETWEEN THE U.S. AND THE SOVIET UNION, BECAUSE OF THE DISADVANTAGED POSITION OF U.S. COMPANIES VERSUS FOREIGN COMPANIES, DUE TO U.S. POLICIES. ALSO, AND NOT MENTIONED PREVIOUSLY, IS THE LACK OF A CONVERTIBLE RUSSIAN RUBLE IN THE NEAR FUTURE. HOWEVER, A

SIGNIFICANT INCREASE IN TRADE VIA SMALL ENTERPRISE JOINT VENTURES WON'T OCCUR SOON, BECAUSE OF THE LONG-TERM NATURE OF THE SMALL ENTERPRISE PROGRAM. IT WILL TAKE AT LEAST TWO YEARS TO GET THE FIRST SMALL ENTERPRISE JOINT VENTURE LAUNCHED. WITH A PROPERLY STRUCTURED PROGRAM, THE FORMATION RATE CAN INCREASE RAPIDLY. THERE IS CONSIDERABLE SIMILARITY BETWEEN THIS PROGRAM AND THE U.S. SMALL BUSINESS INNOVATION RESEARCH PROGRAM. THE SBIR WAS ESTABLISHED BY AN ACT OF CONGRESS ABOUT FIVE YEARS AGO. DURING THAT PERIOD, APPROXIMATELY FOUR THOUSAND COMPANIES RECEIVED GRANTS. THE POTENTIAL IS THERE FOR SIMILAR RAPID GROWTH IN THE NUMBER OF U.S. COMPANIES PARTICIPATING IN THE SMALL ENTERPRISE PROGRAM, AND ULTIMATELY CAN BE GREATER THAN THE NUMBER PARTICIPATING IN SBIR. THERE ARE TWO MAIN REASONS FOR THIS: ONE IS THAT THE SMALL ENTERPRISE PROGRAM REPRESENTS A PRIMARY THRUST OF SOVIET RESEARCH INSTITUTES; WHEREAS, SBIR IS A SECONDARY EFFORT IN U.S. GOVERNMENT LABORATORIES. THE OTHER, AND EVEN MORE IMPORTANT REASON IS THAT SBIR PARTICIPANTS ARE NOT CONCERNED WITH COMMERCIAL MARKETS BUT ONLY USAGE BY THEIR GOVERNMENT ORGANIZATIONS.

FINALLY, AND VERY IMPORTANT, GETTING THE UNITED STATES AND THE SOVIET UNION INVOLVED IN A LARGE NUMBER OF JOINT VENTURES WOULD BE A MAJOR FACTOR IN HELPING TO DEVELOP THE

MUTUAL UNDERSTANDING AMONG THE PEOPLE IN OUR TWO SOCIETIES  
THAT IS NECESSARY TO STABILIZE AND ENHANCE A RELATIONSHIP  
VITALLY IMPORTANT TO BOTH OF US AND THE REST OF THE WORLD  
AS WELL.