

THE WILLIAM C. NORRIS INSTITUTE
AND A FOCUS ON RURAL AMERICA

IT IS A GREAT PLEASURE TO SPEAK ABOUT THE WILLIAM C. NORRIS INSTITUTE AND ITS PROGRAMS FOR ECONOMIC AND SOCIAL IMPROVEMENT IN RURAL AMERICA.

THE NORRIS INSTITUTE IS A NON-PROFIT CORPORATION, ESTABLISHED IN JANUARY 1988 BY A TEN MILLION DOLLAR ENDOWMENT FROM CONTROL DATA CORPORATION. IT IS DEDICATED TO ADVANCING TECHNOLOGICAL COOPERATION, RESPONSIVE TO MAJOR UNMET OR POORLY MET SOCIETAL NEEDS. A VAST INCREASE IN TECHNOLOGICAL COOPERATION TO MORE EFFICIENTLY USE OUR NATION'S SCARCE RESOURCES IS THE SINGLE MOST IMPORTANT ACTION TO BE TAKEN TO MEET THESE NEEDS. STATED ANOTHER WAY, WHAT CAN BE DONE WITH RESOURCES LIKELY TO BE AVAILABLE WILL FALL SHORT OF WHAT IS REQUIRED UNLESS WE MAXIMIZE COOPERATION.

TO A GREAT EXTENT, THE INSTITUTE FUNCTIONS AS A CONCEPTUALIZER, CONSENSUS BUILDER, CATALYST AND PROVIDER OF MANAGEMENT GUIDANCE, WORKING COOPERATIVELY WITH OTHER ORGANIZATIONS FOR IMPLEMENTATION. IT IS NOT A THINK TANK GENERATING REPORTS, WHICH TOO OFTEN ARE IGNORED AND LEFT TO GATHER DUST ON SHELVES, BUT AN INITIATOR AND DRIVER OF SIGNIFICANT COOPERATIVE PROGRAMS.

IN ADDITION, THE INSTITUTE FORMULATES AND ADVOCATES PUBLIC POLICIES. CURRENTLY, SUCH EFFORTS INCLUDE THE ADVOCACY OF FEDERAL ADMINISTRATIVE POLICY AND LEGISLATION CONSTRAINING HOSTILE TAKEOVERS, PROVIDING SEED FUNDING AND TAX INCENTIVES TO ENCOURAGE PUBLIC/PRIVATE TECHNOLOGICAL COOPERATION, AND ACHIEVING EQUITABLE TECHNOLOGY FLOWS BETWEEN THE U.S. AND JAPAN. BECAUSE OF TIME CONSTRAINTS, I WILL FOCUS ONLY ON COOPERATIVE PROGRAMS.

A LIST OF THE CURRENT PROGRAMS I WILL BRIEFLY REVIEW TODAY ARE SHOWN BY THE SLIDE. BEFORE DOING THAT, LET ME ELABORATE ON THE RATIONALE UNDERLYING THE FORMATION OF THE INSTITUTE. ITS GENESIS GOES BACK TO THE TIME I WAS C.E.O. OF CONTROL DATA AND FOR TWO YEARS AFTER MY RETIREMENT FROM THAT POSITION. DURING THOSE YEARS, LONG TERM COOPERATIVE RESEARCH AND DEVELOPMENT PROGRAMS WERE CARRIED OUT, UNDER MY DIRECTION, IN A NUMBER OF THE AREAS ON THE LIST.

SEVERING CONTROL DATA'S PARTICIPATION IN THOSE PROGRAMS WHICH ARE NOW A PART OF THE BROADLY-BASED MISSION BEING PURSUED BY THE NORRIS INSTITUTE, REFLECTS THE COMPANY'S

FOCUS ON A NARROWER SET OF BUSINESS OPPORTUNITIES. AT THE SAME TIME, THE INSTITUTE CAN MORE EFFECTIVELY PURSUE THE COMPREHENSIVE, COOPERATIVE APPROACH NECESSARY FOR ADVANCING INNOVATION, ON A COOPERATIVE BASIS, RESPONSIVE TO MAJOR SOCIETAL NEEDS.

ONE REASON IS THAT A NON-PROFIT STATUS HELPS IN GARNERING GREATER SUPPORT BY GOVERNMENT AGENCIES, FOUNDATIONS AND OTHER CORPORATIONS FOR SUCH LONG-TERM PROGRAMS IN TODAY'S ENVIRONMENT. FOR EXAMPLE, FEDERAL AGENCIES, SUCH AS THE ECONOMIC DEVELOPMENT ADMINISTRATION AND THE DEPARTMENT OF EDUCATION, ARE RELUCTANT TO SUPPORT COOPERATIVE PROGRAMS ON A PROFIT-MAKING BASIS, SUCH AS THOSE FOR RURAL DEVELOPMENT AND IMPROVING EDUCATION. THESE AGENCIES ARE MUCH MORE COMFORTABLE CONTRACTING WITH NON-PROFIT ORGANIZATIONS. FURTHER, PARTICIPATION BY LARGE COMPANIES, SUCH AS CONTROL DATA, IN A PUBLIC/PRIVATE PARTNERSHIP, WAS VIEWED WITH SUSPICION, LEST THEY MAKE A PROFIT. THE LATTER, OF COURSE, WAS THE MAJOR REASON FOR CONTROL DATA'S INVOLVEMENT, AS IT SHOULD BE FOR ANY BUSINESS CORPORATION. HOWEVER, WITH SEED MONEY BEING PROVIDED BY A NON-PROFIT INSTITUTE, THAT CONSTRAINT SHOULD DISAPPEAR.

MANY FOUNDATIONS AND CORPORATIONS ARE ALSO RELUCTANT PARTICIPANTS IN PUBLIC/PRIVATE PARTNERSHIPS. FOUNDATIONS

HAVE MUCH OF THE SAME CONCERNS AS FEDERAL AGENCIES. ON THE OTHER HAND, MOST CORPORATIONS WON'T PARTICIPATE IN PUBLIC/PRIVATE PARTNERSHIPS ADDRESSING SOCIAL NEEDS ON A PROFIT-MAKING BASIS, BECAUSE THESE PROGRAMS ARE LONG TERM AND IN CONFLICT WITH THE SHORT-TERM EMPHASIS WHICH DOMINATES CORPORATE STRATEGY. ALSO, CORPORATIONS HESITATE TO ENTER INTO COOPERATIVE RELATIONSHIPS INVOLVING A NUMBER OF DIFFERENT TYPES OF ORGANIZATIONS, BECAUSE A TYPE OF MANAGEMENT PROCESS IS REQUIRED WHICH IS FOREIGN TO THEM.

HOPEFULLY, THE INSTITUTE WILL HELP CHANGE THOSE ATTITUDES BY DEMONSTRATING SUCCESS WITH COOPERATIVE PROGRAMS WHERE COST AND RISK ARE SHARED, UNNECESSARY DUPLICATION OF EFFORT AVOIDED AND ATTRACTIVE BUSINESS OPPORTUNITIES DEVELOPED.

MCC: AN OUTSTANDING EXAMPLE OF SUCCESSFUL TECHNOLOGICAL COOPERATION IS MCC, THE MICROELECTRONICS AND COMPUTER COMPANY IN AUSTIN, TEXAS. MCC COMMENCED OPERATION IN EARLY 1983. INITIALLY, THERE WERE 11 PARTICIPATING COMPANIES, MAINLY FROM THE U.S. COMPUTER AND SEMICONDUCTOR INDUSTRIES. THIS NUMBER HAS GROWN TO 20. THE STATE OF TEXAS IS PROVIDING SUBSTANTIAL SUPPORT FOR MCC, AND 25 UNIVERSITIES ARE PARTICIPATING IN THE RESEARCH AND DEVELOPMENT EFFORT. THERE IS ALSO PARTICIPATION BY THE FEDERAL GOVERNMENT.

LIKE ANY NEW ORGANIZATION, MCC HAD A NUMBER OF PROBLEMS DURING ITS EARLY DAYS, CAUSED MAINLY BY AN INSUFFICIENT UNDERSTANDING OF THE BENEFITS OF COOPERATION. THESE PROBLEMS HAVE BEEN SOLVED, AND MCC IS PROVIDING SUBSTANTIAL BENEFITS IN TERMS OF MORE EFFICIENT DEVELOPMENT OF TECHNOLOGY. THIS IS EVIDENCED, IN PART, BY THE FACT THAT EACH DOLLAR A PARTICIPATING COMPANY INVESTS IN MCC RESEARCH PROGRAMS PRODUCES RESEARCH RESULTS COSTING AN AVERAGE OF FIVE DOLLARS. THE IMPORTANCE, ALSO, OF SHARING EXTREMELY SCARCE SCIENTIFIC AND ENGINEERING TALENT CANNOT BE OVEREMPHASIZED IN AN ENVIRONMENT WHERE OUR EDUCATION SYSTEM IS FAILING TO PRODUCE SUFFICIENT QUANTITY AND QUALITY OF TECHNOLOGISTS. EVERY INDUSTRY NEEDS ONE OR MORE COOPERATIVE EFFORTS OF THIS TYPE. A FIVE-TO-ONE LEVERAGE IN CREATING BASE TECHNOLOGIES ACROSS THE BOARD IN THIS COUNTRY WOULD PROVIDE A MUCH NEEDED BOOST TO INNOVATION TO MAKE US MORE COMPETITIVE.

MTDI

TO FACILITATE THE FORMATION OF MORE TECHNOLOGICAL COOPERATIVE EFFORTS, THE MIDWEST TECHNOLOGY INSTITUTE (MTDI) WAS ESTABLISHED EARLY IN 1985 BY A CONSORTIUM OF TEN MIDWEST STATES. LIKE MCC, MTDI HAS BEEN CONFRONTED BY STARTUP PROBLEMS, WHICH HAVE SLOWED PROGRESS. FOR THE MOST PART, THE PROBLEMS APPARENTLY HAVE THE SAME SOURCE AS THOSE

IN MCC -- LACK OF UNDERSTANDING OF THE MERITS OF COOPERATION. ONE MANIFESTATION IS LATE OR NON-PAYMENT OF ANNUAL DUES. WISCONSIN NEVER PAID ITS INITIAL ASSESSMENT AND DROPPED OUT AFTER SIX MONTHS. SOUTH DAKOTA DROPPED OUT SOON AFTER WISCONSIN BUT CAME BACK TWO YEARS LATER AS A STRONG SUPPORTER. EARLIER THIS YEAR, TWO OTHER STATES ADVISED THAT EVEN THOUGH AGREEING WITH THE OBJECTIVES OF MTDI, THEY ARE NOT IN A POSITION TO PAY ANNUAL DUES BECAUSE OF TIGHT BUDGETS.

IN ADDITION, MANY MEMBERS OF THE MTDI BOARD OF DIRECTORS, APPOINTED BY THE GOVERNOR OF EACH PARTICIPATING STATE, HAVE TAKEN A NARROW VIEW OF WHAT MTDI SHOULD DO, ESPECIALLY IF IT OVERLAPS TO ANY EXTENT WITH WHAT A STATE IS PRESENTLY DOING. THE OVERLAP IS SEEN AS COMPETITION, AS OPPOSED TO AN OPPORTUNITY FOR COOPERATION.

BECAUSE OF PROBLEMS WITH THE PAYMENT OF DUES, INDIVIDUAL STATE ASSESSMENTS, WHICH INITIALLY RANGED FROM \$100,000 TO \$160,000 (DEPENDING ON POPULATION), WERE CUT TO A UNIFORM \$25,000. SINCE THIS WAS SUFFICIENT TO PAY MTDI ADMINISTRATIVE COSTS, THE DIFFERENCE WAS TO BE MADE UP FROM FOUNDATION GRANTS. HOWEVER, SEVERAL APPLICATIONS TO FOUNDATIONS FOR GRANTS WERE NOT SUCCESSFUL.

THE WILLIAM C. NORRIS INSTITUTE BELIEVES THAT MTDI IS A CRITICALLY IMPORTANT INITIATIVE, ESPECIALLY TO RURAL AREAS, BUT NEEDS MORE TIME TO GAIN THE UNDERSTANDING TO BECOME SUCCESSFUL. THEREFORE, THE INSTITUTE HAS COMMITTED TO MAKE GRANTS WHICH UNDERWRITE UP TO TWO-THIRDS OF THE OPERATING COSTS FOR TWO YEARS.

IN SPITE OF THESE PROBLEMS, TWO MTDI PROGRAMS ARE MAKING SIGNIFICANT PROGRESS. THESE PROGRAMS ARE IN ADVANCED MANUFACTURING AND RURAL DEVELOPMENT. IN ADDITION TO THE GRANTS TO MTDI FOR ADMINISTRATIVE COSTS, THE NORRIS INSTITUTE HAS PROVIDED SUBSTANTIAL FUNDING FOR THESE TWO PROJECTS, WHICH HAVE ALSO RECEIVED SUPPORT FROM STATE AND CORPORATE SOURCES.

AIMSC

LET ME BRIEFLY OUTLINE THESE TWO PROJECTS, BEGINNING WITH ADVANCED MANUFACTURING. THE MTDI COOPERATIVE PROGRAM IN ADVANCED MANUFACTURING IS CALLED THE REGIONAL ADVANCED INTEGRATED MANUFACTURING SERVICE NETWORK. IT IS PART OF A PLANNED NATIONWIDE PROGRAM FOR ACCELERATING THE WIDESPREAD UTILIZATION OF COMPUTER-AIDED DESIGN AND COMPUTER-INTEGRATED, FLEXIBLE MANUFACTURING SYSTEMS.

THE MAJOR IMPETUS FOR THE PROGRAM IS SIMPLY THAT THE U.S. IS NOT GETTING ADVANCED MANUFACTURING TECHNOLOGY IN USE

SOON ENOUGH BY EITHER LARGE OR SMALL COMPANIES. THIS IS PARTICULARLY SERIOUS FOR SMALL COMPANIES BECAUSE OF THEIR IMPORTANT ROLE IN MANUFACTURING AND ADVANCING OTHER ASPECTS OF TECHNOLOGICAL INNOVATION.

REASONS FOR SLOW UTILIZATION OF ADVANCED MANUFACTURING TECHNOLOGY INCLUDE THE RELATIVELY LOW LEVEL OF UNDERSTANDING IN MOST COMPANIES OF THE POTENTIAL OF ADVANCED MANUFACTURING TECHNOLOGY AND THE CAPABILITY TO APPLY IT, DEARTH OF ENGINEERS IN THE FIELD OF ADVANCED MANUFACTURING, THE SUBSTANTIAL COST OF THE EQUIPMENT, COMPUTER SOFTWARE AND TRAINING, HIGH RISK AND AN INITIAL RATE OF RETURN ON INVESTMENT WELL BELOW WHAT IS TRADITIONALLY ACCEPTABLE. ASIDE FROM THE RISK AND RETURN CONSIDERATIONS, MOST SMALLER AND MEDIUM-SIZED COMPANIES SIMPLY DON'T HAVE THE NECESSARY CAPITAL.

THE ONLY PRACTICAL APPROACH FOR ADEQUATELY COPING WITH THESE FORMIDABLE BARRIERS IS TO PLACE IN OPERATION A NATIONWIDE NETWORK OF REGIONAL COMPUTER-AIDED DESIGN AND COMPUTER-INTEGRATED FLEXIBLE MANUFACTURING CENTERS. REGIONAL CENTERS WILL BE INTERCONNECTED AND SERVE LOCAL CENTERS BY PROVIDING ACCESS TO COMPUTER DATA BASES CONTAINING INFORMATION FOR THE MANUFACTURE OF A WIDE RANGE OF COMPONENTS, SUBASSEMBLIES AND EQUIPMENTS. LOCAL CENTERS

WOULD PERFORM DESIGN AND MANUFACTURING ON A SERVICE BASIS WHERE COMPANIES PAY FOR THE SERVICE, AS IT IS USED WITH NO INVESTMENT REQUIRED IN THE REGIONAL FACILITY. EACH COMPANY WOULD UTILIZE THE CENTER THROUGH A WORKSTATION ON ITS OWN PREMISES CONNECTED BY A TELEPHONE CHANNEL.

AN ADVANCED INTEGRATED MANUFACTURING SERVICE CENTER (AIMSC) WOULD HAVE THE CAPABILITY TO MANUFACTURE A WIDE RANGE OF PRODUCTS OF THE HIGHEST QUALITY, LOWEST COST IN THE SHORTEST POSSIBLE TIME AND IN SMALL QUANTITIES. GIVEN ACCESS TO THAT KIND OF FACILITY, U.S. COMPANIES, EVEN SMALL COMPANIES, REGARDLESS OF LOCATION, COULD COMPETE OVER A WIDE RANGE OF PRODUCTS WITH THE LARGEST COMPANIES WORLDWIDE.

THE FIRST REGIONAL CENTER WILL BE LOCATED IN THE TECHNOLOGY CORRIDOR WHICH IS A RESEARCH PARK IN MINNEAPOLIS, CLOSE TO THE UNIVERSITY OF MINNESOTA. PLANNING IS PROCEEDING FOR THE ESTABLISHMENT OF LOCAL AIMSC CENTERS IN ILLINOIS, KANSAS, MINNESOTA, NEBRASKA AND SOUTH DAKOTA.

PLANNING IS ALSO PROCEEDING WITH A NUMBER OF ORGANIZATIONS OUTSIDE OF THE MIDWEST TO ESTABLISH AIMS CENTERS, INCLUDING THE SOUTHERN TECHNOLOGY COUNCIL AND THE NATIONAL INSTITUTE FOR FLEXIBLE MACHINING. LATER THIS YEAR, I BELIEVE THAT A

NATIONAL AIMSC PARTNERSHIP WILL BE FORMED WHICH WILL FACILITATE THE ESTABLISHMENT OF THE NATIONWIDE NETWORK OF AIMS CENTERS WHICH IS ESSENTIAL IN MAXIMIZING EFFECTIVENESS.

OBVIOUSLY, ESTABLISHING AIMS CENTERS IN RURAL AMERICA IS CRITICALLY IMPORTANT, NOT ONLY TO IMPROVE THE COMPETITIVENESS OF EXISTING SMALL AND MEDIUM-SIZED COMPANIES, BUT TO PROVIDE THE MEANS FOR FACILITATING THE STARTUP OF NEW SMALL MANUFACTURING COMPANIES IN A FIERCE COMPETITIVE ENVIRONMENT, WHICH WILL GET EVEN TOUGHER IN THE FUTURE.

RURAL DEVELOPMENT

MTDI'S PROGRAM IN RURAL DEVELOPMENT IS BEING CARRIED OUT BY THE FARM ENTERPRISE PARTNERSHIP, FEP. IT IS A SEPARATE NON-PROFIT ORGANIZATION. AFFILIATED WITH FEP IS THE MINNESOTA FAMILY FARM PARTNERSHIP WHICH FOCUSES ITS EFFORT MAINLY ON MINNESOTA. A BLOCK DIAGRAM SUMMARY OF THE FEP PROGRAM IS SHOWN BY THE SLIDE (FIGURE 1). THERE ARE TWO MAIN CATEGORIES OF FARM TECHNOLOGY BEING ADDRESSED, LOW INPUT, SUSTAINABLE SYSTEMS AND EXPERT SYSTEMS.

SUSTAINABLE SYSTEMS: IN THE FIRST CATEGORY, WORK IS FOCUSED ON THE IDENTIFICATION, DEVELOPMENT AND BROAD

IMPLEMENTATION OF VITAL AGRICULTURAL TECHNOLOGIES, WHICH CAN REDUCE FARM INPUT COSTS, WHILE SIMULTANEOUSLY PROVIDING REGENERATION OF THE SOIL AND PROTECTION OF WATER RESOURCES. THIS EFFORT HAS BEEN MAINLY FINANCED BY FOUNDATION GRANTS.

EXPERT SYSTEMS: THERE ARE FIVE COOPERATIVE R&D PROJECTS IN THE CATEGORY OF EXPERT SYSTEMS. THEY ARE JOINTLY FINANCED BY THE NORRIS INSTITUTE AND PARTICIPATING UNIVERSITIES. THREE OF THE PROJECTS ARE BEING PERFORMED AT THE UNIVERSITY OF ILLINOIS URBANA. THEIR OBJECTIVES ARE DEVELOPMENT OF TWO EXPERT SYSTEM PROGRAMS IN DAIRY FARMING AND ONE IN FARM FINANCIAL MANAGEMENT.

THESE EXPERT SYSTEMS WILL BE USED BY INDIVIDUAL FARMERS TO MANAGE THEIR OPERATIONS MORE PROFITABLY, BY TAKING INTO ACCOUNT A BROADER BASE OF AGRICULTURAL EXPERIENCE.

THE PROJECT AT THE UNIVERSITY OF MINNESOTA IS TARGETED ON OPTIMIZING FARMING SYSTEMS THROUGH THE DEVELOPMENT AND USE OF MODELS OF INTEGRATED AND DIVERSIFIED FARMING OPERATIONS. WITH A SMALL COMPUTER, A FARMER WILL BE ABLE TO USE THESE MODELS FOR STRUCTURING FARM OPERATIONS TO ACHIEVE THE OPTIMAL BALANCE AMONG LOW OPERATING COSTS, LOW CAPITAL INVESTMENTS AND NATURAL RESOURCE CONSERVATION AND PROTECTION.

THE PROJECT AT SOUTH DAKOTA STATE UNIVERSITY IS ANALYZING ALL OF THE FACTORS WHICH AFFECT THE SUCCESS OF FARM FAMILIES IN OPERATING THEIR FARMS, INCLUDING NON-ECONOMIC VALUES.

WHILE THE RESULTS OF THE MINNESOTA AND SOUTH DAKOTA STATE UNIVERSITIES WILL PROVIDE IMPORTANT TOOLS FOR FARMERS, THEY WILL ALSO SERVE AS BUILDING BLOCKS FOR THE LATER DEVELOPMENT OF EXPERT SYSTEMS.

DIVERSIFICATION OF BUSINESS BASE: THE INITIATIVE, RELATIVE TO DIVERSIFICATION OF THE RURAL BUSINESS BASE, IS MAINLY FOCUSED ON IMPROVING THE INFRASTRUCTURE IN RURAL COMMUNITIES FOR SUPPORTING INNOVATION AS THE MAJOR SOURCE OF JOB CREATION AND ECONOMIC DEVELOPMENT. IN EVERY COMMUNITY, SUPPORT IS BEING IMPEDED BY FRACTIONATION OF ORGANIZATIONS ENGAGED IN ECONOMIC DEVELOPMENT. FRACTIONATION IS MANIFESTED BY THE PROLIFERATION OF ORGANIZATIONS, EACH 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, PORT AUTHORITIES, ETC. EACH ORGANIZATION IS DOING SOME GOOD BUT FALLING FAR SHORT OF WHAT NEEDS TO BE DONE BECAUSE OF LACK OF RESOURCES AND

OPERATING IN LARGE PART, IN ISOLATION FROM OTHERS. THROUGH COOPERATION AND/OR CONSOLIDATION, GREATER RESOURCES WOULD BE AVAILABLE AND EFFICIENCY OF OPERATION INCREASED.

AN OPTIMUM TYPE OF SUPPORT INFRASTRUCTURE, CALLED AN INNOVATION NETWORK, HAS BEEN DESIGNED IN COOPERATION WITH A NUMBER OF ORGANIZATIONS ENGAGED IN COMMUNITY DEVELOPMENT; AND IT IS BEING ADVOCATED FOR ADOPTION BY COMMUNITIES. THE ST. PAUL CHAMBER OF COMMERCE IS ASSISTING WITH THE EDUCATIONAL PROGRAMS. BECAUSE OF TIME CONSTRAINTS, I WON'T DESCRIBE IT, EXCEPT TO NOTE THAT IT PROVIDES A STRUCTURE WHERE EXISTING ORGANIZATIONS CAN POOL THEIR RESOURCES AND WORK COOPERATIVELY WITH VERY LARGE GAINS IN EFFECTIVENESS WITH PRESENT RESOURCES.

COMPUTER TECHNOLOGY BASED EDUCATION & TRAINING

WITH RESPECT TO EDUCATION AND TRAINING, LET ME FIRST NOTE THAT MEETING THE DEMAND FOR VASTLY MORE EFFECTIVE EDUCATION AND TRAINING IN RESPONSE TO THE CHALLENGE OF FIERCE FOREIGN COMPETITION WILL REQUIRE BASIC CHANGE. INADEQUATE PROGRESS DURING THE PAST FIVE YEARS HAS SHOWN THAT JUST ADDING ON TO OR MODIFYING THE PRESENT SYSTEM WILL NOT PRODUCE THE DESIRED RESULTS.

WHAT IS NEEDED IS THE ADOPTION, BY K-12 AND UNDERGRADUATE EDUCATION, OF A NEW COMPREHENSIVE APPROACH PROVIDING

PERSONALIZED LEARNING FOR EACH STUDENT AND THE MEANS TO ACHIEVE FULL INDIVIDUAL POTENTIAL. IT IS BASED ON COMPUTER-BASED TECHNOLOGY AS THE PRIMARY METHOD OF DELIVERY, AS OPPOSED TO THE PRESENT USE, IN A SUPPLEMENTARY MODE, FOR PRIMARY, SECONDARY AND UNDERGRADUATE EDUCATION. IN A PRIMARY MODE, THE COMPUTER IS USED TO DISSEMINATE INFORMATION AND KNOWLEDGE, SERVE AS A LABORATORY DEVICE, MANAGE INSTRUCTION, CONDUCT TESTS AND GENERATE REPORTS. THIS FREES TEACHERS OF INEFFICIENT, TRADITIONAL LECTURING, TESTING AND RECORD KEEPING; HENCE, THEY HAVE MORE TIME TO DEVOTE TO MEETING THE NEEDS OF INDIVIDUAL STUDENTS.

ESSENTIAL TO GAINING ADOPTION OF THE COMPREHENSIVE, INDIVIDUALIZED, TECHNOLOGY-BASED APPROACH IS THE ESTABLISHMENT OF A PUBLIC/PRIVATE CONSORTIUM (PPC) TO SUPERVISE THE OPERATION OF SELECTED PRIMARY AND SECONDARY SCHOOLS, OR SCHOOL WITHIN A SCHOOL SEGMENT, UNDER THE AEGIS OF THE LOCAL SCHOOL DISTRICT. THE PPC WILL SELECT A PRIVATE COMPANY TO MANAGE AND OPERATE THE SCHOOL, UNDER ESTABLISHED GUIDELINES AND REGULATIONS. THE NORRIS INSTITUTE WILL ASSIST WITH THE ESTABLISHMENT OF CONSORTIA, AS WELL AS PROVIDING ASSISTANCE IN ASSEMBLING THE NECESSARY RESOURCES.

IN UNDERGRADUATE EDUCATION, THE INSTITUTE WILL FOCUS ON HELPING TO ESTABLISH NEW ENGINEERING SCHOOLS, UTILIZING COMPUTER TECHNOLOGY AS THE PRIMARY MODE OF DELIVERY. A KEY ELEMENT IS COURSEWARE. COMPUTER-BASED EDUCATION COURSEWARE EXISTS FOR THE FIRST TWO YEARS OF ENGINEERING. HOWEVER, MOST OF THE COURSEWARE FOR THE REMAINING TWO OR THREE YEARS WILL HAVE TO BE DEVELOPED. THIS WILL REQUIRE THE ESTABLISHMENT OF COOPERATIVE PROJECTS AMONG UNIVERSITIES TO DEVELOP COURSEWARE.

SOVIET UNION ENTREPRENEURIAL INSTITUTE

BEFORE DESCRIBING THE PROGRAM THAT THE NORRIS INSTITUTE IS PROPOSING WITH THE SOVIET UNION, I SHOULD PROVIDE HIGHLIGHTS ON THE VERY EXTENSIVE SOVIET SCIENCE AND TECHNOLOGY ESTABLISHMENT.

- 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.

- o PRECISE COMPARISONS BETWEEN SOVIET & U.S. OVERALL R&D EXPENDITURES ARE DIFFICULT TO MAKE BECAUSE OF DIFFERENCES IN ACCOUNTING SYSTEMS, LOWER AVAILABILITY OF 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% OF ITS GNP 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 CENTRALIZED ECONOMIC PLANNING, IN WHICH RESEARCH RESPONDS TO GOVERNMENT DIRECTIONS RATHER THAN MARKET NEEDS.

IT IS CLEAR FROM THESE FEW HIGHLIGHTS THAT THERE IS A SIGNIFICANT OPPORTUNITY THROUGH PROPERLY STRUCTURED COOPERATION BETWEEN THE U.S. AND THE SOVIET UNION ORGANIZATIONS TO MORE EFFICIENTLY DEVELOP AND UTILIZE SOVIET TECHNOLOGY, THUS GENERATING GREAT BENEFITS FOR BOTH SIDES.

MORE EFFICIENT UTILIZATION OF TECHNOLOGY IS ONE OF THE MAJOR GOALS OF GORBACHEV'S PERESTROIKA. ANOTHER MAJOR AND CLOSELY RELATED SOVIET GOAL IS THE STATED INTENTION TO DEVELOP, MANUFACTURE AND MARKET PRODUCTS COMPETITIVE IN WORLD MARKETS. ESSENTIAL TO THE SUCCESS OF BOTH GOALS IS THE TRAINING OF A LARGE NUMBER OF ENTREPRENEURIAL MANAGERS.

MEETING THOSE THREE GOALS WILL REQUIRE COOPERATION WITH WESTERN COMPANIES, BECAUSE SUCH EXPERTISE IS NOT RESIDENT IN THE SOVIET UNION. THEREFORE, THE NORRIS INSTITUTE HAS SUBMITTED A PROPOSAL FOR A COOPERATIVE PROGRAM TO BE IMPLEMENTED BY A JOINT VENTURE BETWEEN THE INSTITUTE AND SOVIET ORGANIZATIONS. THE JOINT VENTURE WOULD BE ENGAGED IN TWO MAJOR ACTIVITIES:

1. TRAINING A LARGE NUMBER OF ENTREPRENEURIAL MANAGERS;
2. ESTABLISHING JOINT VENTURES BETWEEN SMALL U.S. BUSINESSES AND SOVIET ORGANIZATIONS, BASED ON SOVIET TECHNOLOGY.

ENTREPRENEURIAL MANAGEMENT TRAINING: LET ME BRIEFLY DESCRIBE EACH PART. FIRST, WITH RESPECT TO ENTREPRENEURIAL MANAGEMENT, ITS HALLMARK IS THE ABILITY TO EXPEDITIOUSLY

COMMERCIALIZE LABORATORY RESEARCH OUTCOMES INTO PRODUCTS WHICH ARE COMPETITIVE IN A GLOBAL ECONOMY. SKILLS REQUIRED INCLUDE THOSE FOR IDENTIFYING MARKET NEEDS, SIMULTANEOUS ENGINEERING, DESIGN AND MANUFACTURING OF PRODUCTS OF HIGHEST QUALITY, LOWEST COST, IN THE SHORTEST POSSIBLE TIME, AND SELLING THEM IN WORLD MARKETS.

ENTREPRENEURIAL MANAGEMENT TRAINING WILL BE FOCUSED MAINLY ON TRAINING MANAGEMENT FOR CREATIVE ENTREPRENEURIAL JOINT ENTERPRISES TO BE ESTABLISHED BETWEEN SMALL U.S. COMPANIES AND SOVIET LABORATORIES. THESE JOINT ENTERPRISES WOULD RESULT FROM THE SECOND MAJOR ACTIVITY OF THE W.C. NORRIS-SOVIET J.V.

PROCEDURE FOR ESTABLISHING JOINT ENTERPRISES: THE PROCESS FOR ESTABLISHING SMALL ENTERPRISE JOINT VENTURES, BASED ON SOVIET TECHNOLOGY, WOULD START WITH THE IDENTIFICATION OF SUITABLE POTENTIAL TECHNOLOGIES. THIS WILL BE ACCOMPLISHED BY REVIEWING RESEARCH OUTCOMES WHICH, WITH FURTHER DEVELOPMENT, WOULD YIELD COMMERCIAL PRODUCTS.

THE PROCEDURE FOR TENTATIVELY SELECTING PROMISING RESEARCH OUTCOMES WOULD BE INITIATED 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 OR CAPABILITY TO SUPPORT A JOINT ENTERPRISE.

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 A SMALL ENTERPRISE JOINT VENTURE, ALL TRAVEL AND OTHER LIAISON COSTS WOULD BE BORNE BY IT.

ONCE INITIAL PERSONAL CONTACT HAS BEEN ESTABLISHED BETWEEN REPRESENTATIVES OF U.S. SMALL COMPANIES AND THE SOVIET LABORATORY, IT IS PROPOSED THAT THEY COMMUNICATE ON A REGULAR BASIS VIA SATELLITE, UTILIZING PERSONAL COMPUTERS.

THUS, 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, INTEREST IS STRONG BY COGNIZANT SOVIET ORGANIZATIONS, AND I EXPECT A LETTER OF INTENT TO NEGOTIATE THE AGREEMENT FOR A JOINT VENTURE WILL BE SIGNED WHEN I RETURN TO MOSCOW IN OCTOBER.

SIGNIFICANCE: WHILE THE SIGNIFICANCE OF SUCH A COOPERATIVE PROGRAM MAY BE OBVIOUS, LET ME HIGHLIGHT ITS MOST IMPORTANT POINTS: 1) THE VAST MAGNITUDE OF THE SOVIET RESEARCH AND TECHNOLOGY ESTABLISHMENT AND ITS CRIPPLING INEFFICIENCIES; 2) THE HUNGER OF MOST U.S. SMALL COMPANIES FOR TECHNOLOGY FOR BRINGING OUT NEW OR IMPROVED PRODUCTS, AND THE MANY ENTREPRENEURS WANTING TO START A COMPANY WHO LACK A TECHNOLOGY ON WHICH TO BASE IT; 3) THE GREAT NEED FOR DIVERSIFICATION IN RURAL AMERICA, WHICH WILL ONLY BE ACHIEVED BY THE STARTUP OF MANY NEW BUSINESSES.

STRUCTURING A COOPERATIVE PROGRAM THAT TAKES INTO ACCOUNT THESE FACTORS WILL RESULT IN A WIN WIN SITUATION FOR EVERYONE INVOLVED; AND FOR THAT REASON, I'M CONVINCED THAT THE PROGRAM WILL GET LAUNCHED AND BE SUCCESSFUL.

CONCLUDE

ON THAT NOTE, LET ME CONCLUDE BY SAYING THAT I AM UNDER NO ILLUSIONS ABOUT THE DIFFICULTIES TO BE ENCOUNTERED IN THE SUCCESSFUL IMPLEMENTATION OF THE INSTITUTE'S PROGRAMS. OBVIOUSLY, THEY ARE LARGE, COMPLEX, LONG TERM AND REQUIRE COOPERATION BY MANY ORGANIZATIONS. A PARTIAL LIST OF THE ORGANIZATIONS WITH WHICH THE INSTITUTE SHARES ONE OR MORE COMMON OBJECTIVES -- AND THUS OPPORTUNITIES FOR COOPERATIVE RELATIONSHIPS IS SHOWN BY THE SLIDE (FIGURE 2). COOPERATION WITH MANY MORE ORGANIZATIONS IS BEING SOUGHT. IF ANY OF YOU IS AWARE OF INTEREST IN ANY OF THE PROGRAMS IN YOUR STATE, I'D BE GLAD TO RESPOND.

THANK YOU.