

training activities regarding rehabilitation technology in order to enhance opportunities for meeting the needs of, and addressing the barriers confronted by, individuals with disabilities in all aspects of their lives. Each RERC must be operated by or in collaboration with an institution of higher education or a nonprofit organization.

#### **Description of Rehabilitation Engineering Research Centers**

RERCs carry out research or demonstration activities by:

(a) Developing and disseminating innovative methods of applying advanced technology, scientific achievement, and psychological and social knowledge to (1) solve rehabilitation problems and remove environmental barriers and (2) study and evaluate new or emerging technologies, products, or environments and their effectiveness and benefits; or

(b) Demonstrating and disseminating (1) innovative models for the delivery of cost-effective rehabilitation technology services to rural and urban areas and (2) other scientific research to assist in meeting the employment and independent living needs of individuals with severe disabilities; or

(c) Facilitating service delivery systems change through (1) the development, evaluation, and dissemination of consumer-responsive and individual and family-centered innovative models for the delivery to both rural and urban areas of innovative cost-effective rehabilitation technology services and (2) other scientific research to assist in meeting the employment and independence needs of individuals with severe disabilities.

Each RERC must provide training opportunities, in conjunction with institutions of higher education and nonprofit organizations, to assist individuals, including individuals with disabilities, to become rehabilitation technology researchers and practitioners.

#### **General RERC Requirements**

The following requirements apply to each RERC pursuant to these absolute priorities unless noted otherwise. An applicant's proposal to fulfill these requirements will be assessed using applicable selection criteria in the peer review process.

Each RERC must have the capability to design, build, and test prototype devices and assist in the transfer of successful solutions to relevant production and service delivery settings. Each RERC must evaluate the

efficacy and safety of its new products, instrumentation, or assistive devices.

Each RERC must develop and implement in the first three months of the grant a plan that describes how the center will include, as appropriate, individuals with disabilities or their representatives in all phases of center activities including research, development, training, dissemination, and evaluation.

Each RERC must develop and implement in the first year of the grant, in consultation with the NIDRR-funded National Center for the Dissemination of Disability Research (NCDDR), a plan to disseminate the RERC's research results to persons with disabilities, their representatives, disability organizations, service providers, professional journals, manufacturers, and other interested parties.

Each RERC must develop and implement in the first year of the grant, in consultation with the NIDRR-funded RERC on Technology Transfer or other entities as appropriate, a plan for ensuring that all new and improved technologies developed by this RERC are successfully transferred to the marketplace.

Each RERC must conduct a state-of-the-science conference on its respective area of research in the third year of the grant and publish a comprehensive report on the final outcomes of the conference in the fourth year of the grant.

Each RERC will be expected to coordinate on research projects of mutual interest with relevant NIDRR-funded projects as identified through consultation with the NIDRR project officer.

#### **Priorities**

##### *Background*

Technology plays a vital role in the lives of millions of disabled and older Americans. Advances in assistive technology and adoption of principles of universal design have significantly improved the quality of life for these individuals. Individuals with significant disabilities regularly use products developed as the result of rehabilitation and biomedical research to achieve and maintain maximum physical function, live independently, study and learn, and attain gainful employment. The range of engineering research has broadened to encompass not only assistive technology but also technology at the systems level (*i.e.*, the built environment, information and communication technologies, transportation, etc.) and technology that interfaces between the individual and

systems technology and is basic to community integration.

The NIDRR RERC program has been a major force in the development of technology to enhance independent function for individuals with disabilities. The RERCs are recognized as national centers of excellence in their respective areas and collectively represent the largest federally supported program responsible for advancing rehabilitation engineering research. For example, the RERC program was an early pioneer in the development of augmentative communication and has been at the forefront of prosthetics and orthotics research for both children and adults. RERCs have played a major role in the development of voluntary standards that industry uses when developing wheelchairs, wheelchair restraint systems, information technologies, and the World Wide Web. The RERC on Low Vision and Blindness helped develop talking sign technologies that are currently being utilized in major cities in both the United States and Japan to help blind and visually impaired individuals navigate city streets and subways. RERCs have been a driving force in the development of universal design principles that can be applied to the built environment, information technology and telecommunications, transportation, and consumer products. RERC research activities also contributed to the clinical use of electromyography, gait analysis, and functional electrical stimulation.

Advancements in basic biomedical science and technology have resulted in new opportunities to enhance further the lives of people with disabilities. Recent advances in biomaterials research, composite technologies, information and telecommunication technologies, nanotechnologies, micro electro mechanical systems (MEMS), sensor technologies, and the neurosciences provide a wealth of opportunities for individuals with disabilities and should be incorporated into research focused on disability and rehabilitation.

NIDRR intends to fund up to nine new RERCs in FY 2003. Applicants must select one of the following priority topic areas: (a) Hearing enhancement; (b) prosthetics and orthotics; (c) communication enhancement; (d) measurement and monitoring of functional performance; (e) technology access for land mine survivors; (f) universal interface and information technologies; (g) telerehabilitation; (h) accessible public transportation; (i) wheeled mobility; (j) cognitive technologies; and (k) technology